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USEFUL DRUGS

PREPARED UNDER THE DIRECTION AND SUPERVISION OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION

A List of Drugs Selected to Supply the Demand for a Less Extensive Materia Medica and Especially to Serve as a Basis for the Teaching of Materia Medica and Therapeutics, and for Examinations on These Subjects by State Licensing Boards, with a Discussion of their Actions, Uses and Dosage.

Third Edition

PRESS OF THE AMERICAN MEDICAL ASSOCIATION
535 North Dearborn Street, Chicago
1917

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1917

PREFACE TO SECOND EDITION

It has long been recognized that the multiplicity of drugs and preparations of drugs presented to the attention of the medical profession is an evil. Leaving out of account the articles described in the National Formulary and the vast number described in dispensatories and similar unofficial compilations, the number of drugs and preparations described in the Pharmacopeia alone is far too large for intelligent practical use. Of even greater importance is the well-known fact that a considerable proportion of Pharmacopeial drugs and preparations are superfluous or worthless. Repeated attempts to eliminate such articles from the Pharmacopeia have failed because they have uniformly encountered the objection that the articles or preparations are used by some physicians and therefore should be recognized and authoritatively defined.

In the preface to the last edition of his "Text-Book of Pharmacology and Therapeutics," Cushny announces that the space devoted to many of the less important and less reliable drugs has been much curtailed, that many have been omitted altogether from consideration, and that this is in accordance with the general trend of medical progress and further that therapeutics would probably not have suffered from an even more drastic selection. He further says:

"For as long as he [the medical student] has to learn the supposed virtues of a host of obscure substances, he will tend to use them in practice, even if only tentatively. This in turn necessitates their inclusion in the pharmacopeias, which again gives them some standing and perpetuates them as subjects of teaching and examination. If examiners would break this vicious circle, they would render the subject of pharmacology more attractive to him. There is no question that the insistence on numberless preparations of drugs of questionable value has discouraged interest in therapeutics."

Efforts were made by the Council on Medical Education of the American Medical Association and the Confederation of State Examining and Licensing Boards to restrict instruction and examination in materia medica to the more important drugs, and this suggested the desirability of selecting a fundamental list of drugs with which all medical students *and practitioners* might be expected to be familiar and to

which, therefore, state examining and licensing boards might largely or entirely confine their examinations in materia medica. A list prepared by the Council on Medical Education and the National Confederation of State Medical Examining and Licensing Boards was taken as a basis by the Council on Pharmacy and Chemistry, and, after various revisions, more or less guided by numerous criticisms and suggestions from teachers of materia medica, deans of medical schools, secretaries and members of state medical examining and licensing boards, and other members of the medical profession, was published in a preliminary form under the title "Useful Remedies." After still further revision in the light of advice and information elicited through this preliminary publication, the first edition of the present volume was published under the title "A Handbook of Useful Drugs." This little work presented a brief but practical discussion, from the modern point of view, of the drugs which remained after the winnowing and sifting process above described. It was offered as a text on which teachers of materia medica and therapeutics might base their instruction and state examining boards their examinations. In the words of the preface to the first edition, it was "confidently predicted that an intelligent and critical use of these selected drugs will prove their general sufficiency and show that many drugs now discussed in textbooks are superfluous and that many newly discovered or widely exploited proprietary preparations have no advantage over those contained in this book." This prediction has been more and more justified since the original publication in 1913. A number of medical schools and state medical examining and licensing boards have taken "Useful Drugs" as a basis for their instruction and examinations in materia medica.

As the time of publication of the ninth revision of the U. S. Pharmacopeia and the fourth edition of the National Formulary coincided with the preparation of this edition of "Useful Drugs," the changes in the requirements of these two official books of standards have naturally been incorporated in this volume.

PREFACE TO THIRD EDITION

The only important changes from the 1916 edition consist in the addition of Theophylline and of Antimeningococcus Serum, which appeared to the Council of sufficient therapeutic importance to be counted among "Useful Drugs"; and the omission of Dilute Hydrocyanic Acid and of Diacetylmorphine (Heroin) Hydrochloride. The following reasons prompted the Council to order these deletions:

Dilute hydrocyanic acid was admitted to "Useful Drugs" because of its importance as a poison. This is no longer a sufficient justification for its inclusion, since it has become practically obsolete as a remedial agent. The Council therefore directed its omission from future editions of "Useful Drugs."

Heroin was included in "Useful Drugs" because of its extensive use in coughs, etc. This use originated largely because of claims, no longer accepted, that heroin was a safe drug, especially from the habit producing standpoint, as well as on account of other claimed advantages which further work has failed to confirm.

The Council holds that heroin has no advantage over morphine; that it shares every disadvantage of morphine; and that on the whole, its introduction has been harmful, in that it furnished a specious means on the one hand for avoiding the well founded popular fears of morphine by substituting another habit forming drug.

While heroin undoubtedly accomplishes whatever morphine accomplishes, and in *that* sense may be considered as a useful drug, it does not deserve a place in the selected list that is authorized by the Council.

ABBREVIATIONS

The following abbreviations occur in the text:

U. S. P.—The Pharmacopeia of the United States of America, Ninth Revision.

N. F.—The National Formulary, Fourth Edition.

N. N. R.—New and Nonofficial Remedies, 1916.

STATEMENT OF SOLUBILITY

For ease of reference the solubility of official articles is indicated in approximate terms in accordance with the following equivalents:

Substances that are soluble in less than

1 part of solvent = very soluble.
From 1 to 10 parts of solvent = freely soluble.
From 10 to 100 parts of solvent = soluble.
From 100 to 1,000 parts of solvent = slightly soluble.
From 1,000 to 10,000 parts of solvent = very slightly soluble.
From 10,000 to 100,000 parts of solvent = nearly insoluble.
More than 100,000 parts of solvent = practically insoluble.

The solubility values are for distilled water at approximately 25 C. and for the official U. S. P. alcohol at the same temperature.

USEFUL DRUGS

Acacia (Acac.), Acacia, U. S. P. (Gum Arabic).—A gummy exudation from *Acacia senegal* and other African species of acacia.

PROPERTIES: Acacia occurs in colorless or pale yellowish opaque, brittle, inodorous tears or fragments which are completely soluble in water (1: 2), but practically insoluble in alcohol.

MUCILAGO ACACIAE (MUCIL. ACAC.), MUCILAGE OF ACACIA, U. S. P.—A 35 per cent. solution of acacia in distilled water.

ACTION AND USES: Acacia and its mucilage are used as demulcents and suspending agents in the making of emulsions and mixtures.

Acetanilidum (Acetanil.), Acetanilid, U. S. P. (Antifebrin).—The monacetyl derivative, $C_6H_5NH(CH_3CO)$, of anilin.

PROPERTIES: Acetanilid is an odorless, crystalline powder, having a slightly burning taste. It is only slightly soluble in water (1: 190), but freely soluble in alcohol (1: 3.4).

INCOMPATIBILITIES: Acetanilid is incompatible with spirit of nitrous ether. It forms a semiliquid mass when triturated with chloral or antipyrin.

ACTION AND USES: Acetanilid is analgesic, antipyretic and, in excessive doses, a cardiac depressant. These effects are probably due to para-aminophenol, into which it is converted in the body.

Moderate doses have little effect on the temperature of normal animals and men, but such doses cause a marked reduction of the temperature in fever. Large doses, or small doses taken habitually, convert hemoglobin into methemoglobin and may destroy the red blood-corpuscles. In poisonous doses acetanilid produces cyanosis, abnormal reduction of temperature, coldness of the extremities and profuse sweating. In individuals with an idiosyncrasy toward the drug similar symptoms may be produced by small doses. It should be avoided or used cautiously in patients who are debilitated from any cause.

Acetanilid is effective for the relief of headache and neuralgic pain, but is not suited to the treatment of pain caused by inflammation.

DOSAGE: 0.20 Gm. or 3 grains. It is well to begin with 0.10 Gm. or about 2 grains and to repeat cautiously. Formerly mixtures of acetanilid with caffein or ammonium salts were advised on the supposition that the cardiac depression would thus be avoided, but this does not seem to be the case. Investigation has shown that acetanilid is rendered somewhat more toxic by caffein. The drug

should be used cautiously and only for definite indications. Acetanilid has been widely exploited in the form of varying mixtures under different names for the relief of all pain. Many so-called headache powders contain it, but its indiscriminate use in this way is dangerous. It may be administered dry in the form of powders, cachets or capsules; because of its slight solubility it should not be massed in pills or compressed into tablets unless the tablet is crushed with the teeth before swallowing or unless care is taken in the manufacture of the tablet to insure its rapid disintegration in the stomach.

Acetphenetidinum (Acetphen.), Acetphenetidin, U. S. P. (Phenacetin).—$C_6H_4(OC_2H_5).NH(CH_3CO)$. Acetphenetidin differs from acetanilid in containing the ethoxyl group C_2H_5O.

PROPERTIES: Acetphenetidin occurs as white, crystalline scales or a crystalline powder. It is odorless and slightly bitter. It is very slightly soluble in water (1: 1310), but soluble in alcohol (1: 15).

INCOMPATIBILITIES: The same as for acetanilid.

ACTION AND USES: Similar to those of acetanilid. The analgesic, antipyretic and cardiac depressant effects of acetphenetidin, like those of acetanilid, are due to the formation of para-aminophenol, and its possible advantage over acetanilid is probably due to the fact that this decomposition occurs more slowly. It is best administered in the form of powders, cachets or capsules.

Since the enactment of the Food and Drugs Act, June 30, 1906, acetphenetidin has frequently displaced acetanilid as the active agent in proprietary mixtures for the relief of headache and other pain. Its relation to acetanilid suggests similar caution in its use.

DOSAGE: A full dose is 0.30 Gm. or 5 grains. It is well to begin with 0.20 Gm. or 3 grains, and repeat every three hours if needed for a few doses. When small doses fail to relieve headache, larger doses are also usually ineffective.

Acidum Aceticum (Acid. Acet.), Acetic Acid, U. S. P.—A solution containing about 36 per cent. by weight of absolute acetic acid, CH_3COOH. (In some European countries a preparation comparable to glacial acetic acid, U. S. P., containing 99 per cent. of absolute acetic acid, is known as acetic acid, and the article that is official in the U. S. P. as "diluted acetic acid" is sometimes described as acetum or vinegar.)

Diluted Acetic Acid, U. S. P., contains 6 per cent. of absolute acetic acid.

PROPERTIES: Acetic acid is a clear, colorless liquid. In all of its forms it is freely miscible with water.

ACTION AND USES: Acetic acid, as such, is not ordinarily used internally, but when administered in the diluted form *it is mildly diaphoretic* and diuretic. Externally it is a *caustic, rubefacient* and parasiticide.

Acidum Acetylsalicylicum, Acetylsalicylic Acid, N. N. R. (Aspirin).—$C_6H_4.O(CH_3CO).COOH$,1 : 2. The acetic acid ester of salicylic acid.

PROPERTIES: Acetylsalicylic acid occurs as a crystalline, odorless powder with a faintly acidulous taste. It is slightly soluble in water (1: 100) and freely soluble in alcohol.

ACTION AND USES: Acetylsalicylic acid acts like salicylic acid and the salicylates, but is claimed to be less disturbing to the stomach. It is employed as an antipyretic, analgesic and antirheumatic. It is much used for the relief of headache and other painful affections. Acetylsalicylic acid is not free from untoward secondary effects.

DOSAGE: 0.3 to 1 Gm. or 5 to 15 grains, repeated once in three hours until symptoms of salicylism (ringing in the ear, etc.) are noted.

Acidum Benzoicum (Acid. Benz.), Benzoic Acid, U. S. P.—An organic acid, $C_6H_5.COOH$, obtained from benzoin by sublimation, or prepared synthetically.

PROPERTIES: Benzoic acid occurs as lustrous scales or needles, having an odor resembling benzoin, when obtained from the latter, and a pungent, acid taste. It is only slightly soluble in water (1: 275), but is soluble in alcohol (1: 2.3). It reacts with alkali hydroxids, and carbonates to form water-soluble benzoates.

ACTION AND USES: Benzoic acid is a mild antiseptic. It is excreted in the urine in the form of hippuric acid (benzoyl glycocoll).

DOSAGE: 0.5 Gm. or 8 grains. It is preferably dispensed in the form of powder and may be enclosed, dry, in capsules or cachets. It is more frequently used in the form of soluble compounds (see **Sodii Benzoas**).

Acidum Boricum (Acid. Bor.), Boric Acid, U. S. P. (Boracic Acid, obsolete) $(H_3BO_3)=B(OH)_3$.

PROPERTIES: Boric acid occurs as transparent, colorless scales or a light, unctuous, very fine powder. It is odorless, has a faintly bitter taste and is slowly soluble in water (1: 18), soluble in alcohol (1: 18) and freely soluble in glycerin (1: 4).

ACTION AND USES: Boric acid is a mild antiseptic. It has been occasionally administered internally, but with little effect, in cystitis. Externally it is frequently used as a dusting powder, either alone or combined with diluents such as starch or talcum, or with active substances such as acetanilid, salicylic acid or iodoform. It is also widely used as a wash or lotion, especially for catarrh of the mucous membranes, cystitis, conjunctivitis, pharyngitis, etc., usually in simple aqueous solutions containing from 2 to 4 per cent. of boric acid. This is one of the most frequently used lotions for conjunctivitis. It is also very useful for *irrigating* the bladder in cystitis. It is used in the form

of glycerite of boroglycerin in washes and injections. The ointment is mildly antiseptic but is chiefly used as a protective dressing.

GLYCERITUM BOROGLYCERINI (GLYCER. BOROGLYC.), GLYCERITE OF BOROGLYCERIN, U. S. P.—A glycerin solution representing 31 per cent. of boric acid.

UNGUENTUM ACIDI BORICI (UNG. ACID. BOR.), OINTMENT OF BORIC ACID, U. S. P.—A 10 per cent. mixture of boric acid with paraffin and white petrolatum.

Acidum Citricum (Acid. Cit.), Citric Acid, U. S. P.—A tribasic organic acid, $H_3C_6H_5O_7+H_2O$, usually prepared from the juice of limes or lemons.

PROPERTIES: Citric acid forms colorless, transparent crystals; odorless and having an agreeable purely acid taste. It is very soluble in water (1: 0.5) and freely soluble in alcohol (1: 1.8).

ACTION AND USES: Citric acid may be used as a substitute for lemon-juice. Like the other organic acids, it is oxidized in the system to carbonic acid, so that its acid effects are much reduced. If an alkaline carbonate be added an effervescing mixture is obtained which gives the therapeutic effects of the alkalies.

DOSAGE: 0.5 Gm. or 8 grains. It may be prescribed in the form of a syrup or as lemonade.

Acidum Diaethylbarbituricum.—See under **Veronal.**

Acidum Hydrochloricum (Acid. Hydrochl.), Hydrochloric Acid, U. S. P. (Muriatic Acid).—A fuming corrosive liquid containing about 32 per cent. of hydrogen chlorid, HCl.

ACIDUM HYDROCHLORICUM DILUTUM (ACID. HYDROCHL. DIL.), DILUTED HYDROCHLORIC ACID, U. S. P.—A solution containing about 10 per cent. of hydrogen chlorid, HCl.

PROPERTIES: Diluted hydrochloric acid is a colorless, odorless, strongly acid aqueous solution; freely miscible in all proportions with water or alcohol.

INCOMPATIBILITIES: It is incompatible with alkalies, carbonates and oxids, with which it reacts to form chlorids, and with the soluble salts of silver and of lead, forming insoluble silver chlorid and lead chlorid.

ACTION AND USES: Hydrochloric acid is the acid of the gastric juice. It is necessary to the digestive action of pepsin and acts as an antiseptic in the stomach. By checking fermentation and putrefaction in the stomach it tends to prevent these processes in the intestine.

Diluted hydrochloric acid is used for the treatment of diseases of the stomach characterized by a deficiency of *acid in the gastric* juice on the theory that it replaces the *acid lacking in the* secretion. To restore the acidity of

the stomach contents to the normal average would require much larger doses than are commonly given. It seems probable, therefore, that the acid as ordinarily given acts mainly as an appetizer and tonic. The utility of hydrochloric acid in achylia gastrica is more manifest in the nervous forms and in the earlier stages of the organic variety. In some cases it causes distress and should be discontinued. There is some evidence to show that the continued administration of the acid is capable of increasing the gastric secretion. Hydrochloric acid also exerts a favorable influence on the secretion of the pancreatic and intestinal juices and on the motor functions of the stomach.

Hydrochloric acid is also of service in intestinal putrefaction, especially when the gastric digestion is impaired. It is indicated in achylia gastrica for the diarrhea caused by the irritant action of undigested meat and the putrefaction of proteins which have escaped gastric digestion.

DOSAGE: 1 Cc. or 15 minims of the diluted acid in about half a glass of water. It should be given after meals and the dose repeated at the end of an hour. Five drops in a wineglassful of water after meals are often sufficient.

Acidum Nitricum (Acid. Nitric.), Nitric Acid, U. S. P.—A liquid containing about 68 per cent., by weight, of hydrogen nitrate, HNO_3.

PROPERTIES: Nitric acid is colorless, fuming, very caustic and corrosive and has a peculiar, somewhat suffocating odor. It is miscible with water in all proportions, dissolves mercury and most other metals with evolution of red fumes and stains woolen fabrics and animal tissues a bright yellow.

INCOMPATIBILITIES: Like other inorganic acids, it is incompatible with alkalies, the alkali carbonates, many of the salts of organic acids, and, because of its oxidizing properties, with all readily oxidizable substances. Its addition to organic liquids (alcohol, etc.), is apt to give rise to explosive reactions.

ACTION AND USES: Nitric acid is a powerful caustic, used for removing warts and small nevi and for cauterizing chancroids and other sores, and the wounds made by rabid animals, but its action is very painful and not readily controlled. When nitric acid is used as a caustic, the surrounding healthy tissue should be coated with petrolatum and the acid applied on the end of a rod of glass or wood.

Acidum Phenylcinchoninicum (Acid. Phenylcinch.), Phenylcinchoninic Acid, U. S. P. (Phenyl-Quinolin-Carboxylic Acid, Atophan).—An organic acid, 2-phenyl-quinolin-4 carboxylic acid, $C_6H_5.C_9H_6N.(COOH)$.

PROPERTIES: Phenylcinchoninic acid occurs in small colorless crystals or as a white or yellowish-white powder, having not more than a *slight odor resembling* benzoic acid and a bitter taste. It is permanent *in air, insoluble* in cold water and only slightly soluble in cold alcohol.

ACTION AND USES: Phenylcinchoninic acid or atophan and its derivatives stimulate the kidneys to increase the amount of urine. Atophan is said to have a selective action on the excretion of uric acid. Its influence on uric acid excretion is stronger and is exerted more promptly than that of sodium salicylate. The action of atophan grows weaker after the first three hours and is practically terminated in nine hours after the administration of the dose. The amount of ammonia and of total nitrogen in the urine are slightly increased during the action of atophan, but not in proportion to the increase in the uric acid of the urine. Atophan does not increase the leukocytes, the purin bases or the phosphoric acid. There is no evidence of increased formation of uric acid or of any effect on deposited urates. It is stated, however, that the tophi in gout grow smaller under the use of atophan. Atophan is useful in acute gout; it relieves pain in this disease, acting more promptly than colchicum and without undesirable by-effects.

DOSAGE: 0.5 Gm. or 8 grains four times a day to 1 Gm., or 15 grains three times a day suspended in large quantities of water.

NOVATOPHAN.—The trade name for ethyl 6-methyl-2-phenyl-quinolin-4-carboxylate, $CH_3.C_9H_4N.C_6H_5COOC_2H_5$, 6:2:4.

ACTION AND USES: The same as those of phenylcinchoninic acid. Novatophan is practically tasteless.

DOSAGE: Same as that of phenylcinchoninic acid.

Acidum Picricum.—See **Trinitrophenol, U. S. P.**

Acidum Salicylicum (Acid. Salicyl.), Salicylic Acid, U. S. P.—An organic acid, $C_6H_4(OH)COOH$, generally prepared synthetically from phenol.

PROPERTIES: Salicylic acid occurs as fine, white needles or as a bulky white crystalline, odorless powder, having a sweetish, subsequently acrid taste. It is only slightly soluble in water (1: 460), but freely soluble in alcohol (1: 2.7), or in ether (1: 3). Salicylic acid reacts with alkali hydroxids and carbonates to form water-soluble salts. With solution of ferric chlorid it gives a deep purple color.

INCOMPATIBILITIES: It is incompatible with salts of iron and with spirit of nitrous ether.

ACTION AND USES: Salicylic acid is an antiseptic. It is quite irritant to mucous membranes and somewhat corrosive. Internally it has the actions described under sodium salicylate, in which form it is commonly employed. Externally it has been used as an application in pruritus, urticaria, bromidrosis and in some forms of eczema; also *in the form* of ointments and collodions to soften and *remove corns and warts.*

DOSAGE: Internally it is best given in the form of soluble salicylates. (See **Sodii Salicylas.**) Externally it is applied as an astringent in from 1 to 2 per cent. alcoholic solution or ointment; as an antiseptic, antiparasitic and keratolytic agent, in 2 to 5 per cent. dusting-powder, or ointment, and as a strong keratolytic in proportions up to 20 per cent., best dissolved in collodion. Continuous application to the skin may occasion slight corrosion.

Acidum Tannicum (Acid. Tann.), Tannic Acid, U. S. P. (Tannin, Gallotannic Acid).—A tannin usually obtained from nutgalls.

PROPERTIES: Tannic acid occurs as a light yellowish, amorphous powder, gradually turning darker when exposed to air and light. It has a faint, characteristic odor and a strongly astringent taste. Tannic acid is very soluble in water, alcohol and glycerin.

INCOMPATIBILITIES: It is incompatible with alkalies, alkaloids, salts of iron and of most other metals, albumin and gelatin. With alkaloids and the salts of the heavy metals it reacts to form insoluble compounds.

ACTION AND USES: Tannic acid is used as an astringent and hemostatic. Internally it has been chiefly employed in the treatment of diarrhea. It is but little used with infants or children. It should be employed not as the principal curative agent, but as an occasional adjunct to proper dietetic and physical remedies when the discharges are unduly profuse. Its astringent action, however, often causes nausea and vomiting and hence a protein combination, such as tannalbin, is better for action on the intestine. Local applications of tannic acid are frequently made to inflamed mucous membrane, especially in pharyngitis. It is employed as a local application in the treatment of hemorrhoids in the form of a 20 per cent. ointment or as a suppository containing 0.3 Gm. or 5 grains.

DOSAGE: 0.5 Gm. or 8 grains.

GLYCERITUM ACIDI TANNICI (GLYCER. ACID. TANN.), GLYCERITE OF TANNIC ACID, U. S. P. (Glycerite of Tannin).—A 20 per cent. solution of tannic acid in glycerin.

DOSAGE: 2 Cc. or 30 minims, corresponding to 0.4 Gm. or 6 grains of tannic acid. This preparation is chiefly used externally and affords a convenient agent for making dilute solutions for local use. For local applications solutions containing from 0.5 to 2 per cent. of tannic acid are appropriate.

To prevent the astringent action of tannic acid on the gastric mucosa, various organic combinations of tannic acid have been prepared which resist the action of the gastric juice to a greater or less extent and, escaping solution in the stomach, do not become active until they reach the intestine.

TANNALBIN, TANNALBIN, N. N. R. (Albumin Tannate).—It is insoluble in gastric juice and becomes effective when it reaches the intestine.

DOSAGE: 2 Gm. or 30 grains.

Aconitum (Aconit.), Aconite, U. S. P. (Monkshood, Aconite Root, Aconiti Tuber, P. I.).—The dried tuberous root of *Aconitum napellus* L. Yields not less than 0.5 per cent. of the ether-soluble alkaloids of aconite. When extracted and assayed biologically the minimum lethal dose should not be greater than the equivalent of 0.04 mg. of aconite for each gram of body weight of guinea-pig.

ACTION AND USES: Aconite slows the pulse and thus tends to lower the blood-pressure. The nervous system is first stimulated and then depressed. Death occurs from respiratory paralysis. Locally applied, aconite causes tingling and paralysis of the sensory nerve endings.

Aconite is used internally as a cardiac depressant antipyretic and diaphoretic, especially in sthenic fevers of short duration or in the initial stage only of other diseases. It should be avoided in fevers accompanied by cardiac weakness. The danger from the depressing action of aconite on the heart makes it an undesirable agent to use as a cardiac depressant. Its use is constantly diminishing.

Externally it is useful, in the form of the tincture, as a local application for the relief of neuralgic pain.

TINCTURA ACONITI (TR. ACONIT.), TINCTURE OF ACONITE, U. S. P. (Aconiti Tinctura, P. I.).—Contains from 0.045 to 0.055 per cent. of the ether-soluble alkaloids of aconite. If assayed biologically the minimum lethal dose should not be greater than 0.0004 Cc. for each gram of body weight of guinea-pig. One hundred Cc. represent 10 Gm. of the drug in approximately 65 per cent. of alcohol.

DOSAGE: 0.2 Cc. or 3 minims should be given hourly until the desired effect on the pulse is secured. Locally the tincture may be applied cautiously over the affected nerve, or a liniment containing 10 per cent. of the tincture may be prescribed. Application to mucous membrane should be carefully avoided. The local application of the undiluted tincture is dangerous, as too much absorption may occur.

Adeps, Lard, U. S. P.—True fats, chiefly those of animal origin, form an important class of ointment bases. They are especially valuable when penetrating ointments are desired for softening the skin for inunctions, etc. Lard is the chief fat thus used. Like all animal fats, it is very liable to become rancid. To mitigate its odor and to hinder the occurrence of rancidity the following preparation is used.

ADEPS BENZOINATUS (ADEPS BENZ.), BENZOINATED LARD, *U. S. P.—Benzoinated lard is made by incorporating with lard 1 per cent. of benzoin and straining.*

Adeps Lanae Hydrosus (Adeps Lan. Hyd.), Hydrous Wool Fat, U. S. P. (Lanolin).—This preparation is made by mixing the purified fat of sheep's wool with water in a proportion not to exceed 3 parts of the latter to 7 parts of the former.

Lanolin is used as an ointment base. It has the advantage that it does not become rancid, but its odor and consistence are disagreeable. The old statement that it is more readily absorbed than other ointment bases has not been borne out by experience.

Adrenalin.—See **Epinephrin.**

Aether, Ether, U. S. P.—A liquid composed of about 96 per cent., by weight, of ethyl oxid, $(C_2H_5)_2O$, and about 4 per cent. of alcohol, C_2H_5OH.

PROPERTIES: It is volatile, inflammable, and the vapors, which are about two and one half times as heavy as air, are dangerously explosive when mixed with air. Ether is soluble in water (1: 12) and miscible with alcohol; when administered internally it is usually directed to be dispensed in the form of an alcoholic solution.

ACTION AND USES: Ether is used mainly by inhalation for the production of anesthesia. It depresses all parts of the central nervous system, causing loss of sensation, loss of consciousness and abolition of the reflexes. The vital centers of the medulla are involved very late in the poisoning, a fact which enhances the safety of this anesthetic. The respiratory center is the first of these to be affected. Later there is depression of the vasomotor center and consequent fall of blood-pressure. Ether does not produce a marked effect on the heart, but its first action is a moderate reflex stimulation. In poisonous doses it depresses the heart. In the administration of ether as an anesthetic, caution should be exercised to have the ether at a distance from and, if possible, below any fire or flame, to avoid setting fire to the heavy inflammable vapors. For anesthesia a pure ether, preferably anhydrous, should be used. Administered internally it is an anodyne, sedative, carminative and antispasmodic.

DOSAGE: 1 Cc. or 15 minims.

SPIRITUS AETHERIS (SP. AETH.), SPIRIT OF ETHER, U. S. P. —A 32.5 per cent. alcoholic solution.

DOSAGE: 4 Cc. or 1 fluidram, well diluted with cold water or on cracked ice.

Aether Nitrosus, Nitrous Ether.—Ethyl nitrite, $C_2H_5NO_2$. Used only in the form of:

SPIRITUS AETHERIS NITROSI (SP. AETH. NITROS.), SPIRIT OF NITROUS ETHER, U. S. P. (Sweet Spirit of Niter).—A solution of from 3.5 to 4.5 per cent. of ethyl nitrite *in alcohol.*

PROPERTIES: Spirit of nitrous ether is a pale yellowish liquid having a fragrant, ethereal and pungent odor and a sharp, burning taste. It is miscible with alcohol or water. It deteriorates rapidly.

INCOMPATIBILITIES: It is incompatible with acetanilid, antipyrin, potassium iodid and sodium salicylate.

ACTION AND USES: Spirit of nitrous ether is popularly used as a weak diuretic and diaphoretic. It is of doubtful value in many of the conditions for which it is commonly used. It is frequently prescribed in mixtures with other diaphoretics, notably the solution of ammonium acetate.

DOSAGE: 2 Cc. or 30 minims.

Aethylis Chloridum (Aethyl. Chlor.), Ethyl Chlorid, U. S. P. —Monochlorethane, C_2H_5Cl.

PROPERTIES: Ethyl chlorid is a colorless and very volatile liquid having an agreeable odor and a sweetish burning taste. It should be preserved in hermetically sealed glass tubes and kept in a cool place remote from light or fire.

ACTION AND USES: Ethyl chlorid is widely used in the form of spray to produce a local anesthesia by refrigeration for minor operations. When inhaled it produces prompt anesthesia, suitable for very short operations, but even then not without danger of producing accidents similar to those of chloroform. Because of these dangers and the difficulty of handling, it is now rarely used for general anesthesia.

Aethylmorphinae Hydrochloridum (Aethylmorph. Hydrochl.), Ethylmorphin Hydrochlorid, U. S. P. (Ethylmorphin Chlorid, Dionin).

PROPERTIES: Ethylmorphin is an artificial base obtained by the action of ethyl iodid on morphin in the presence of an alkali. The hydrochlorid occurs as a white, microscopically crystalline powder, odorless and having only a slight bitter taste. Ethyl-morphin hydrochlorid is freely soluble in water (1: 8) and in alcohol (1: 22), but practically insoluble in ether and in chloroform.

ACTION AND USES: When administered internally, the action of this drug is intermediate between the action of morphin and that of codein, but it is claimed that ethylmorphin hydrochlorid does not produce constipation, nausea or lassitude. The conclusion of careful observers, however, is that, for internal use, it possesses no advantage over codein.

When applied to the eye this drug causes a local vasodilatation, terminating in acute conjunctival edema. The chemosis thus produced is employed for its analgesic and curative effects in conjunctivitis, corneal ulcer, acute glaucoma, iritis, scleritis and other inflammatory diseases of the uveal tract. The greater the edema of the conjunctiva induced by it, the more decided is its analgesic action.

DOSAGE: 0.015 Gm. or ¼ grain. Externally it is commonly employed in a collyrium in strength varying from *5 to 10 per cent.* The strength may be increased to 20 per

cent., and it is sometimes used in powder form. The ophthalmologist should make the first application and determine the minimum strength of solution which will produce the necessary chemosis. This dose should not be increased until it loses its effect. The action of the remedy may be regarded as sufficient as long as its application is followed by chemosis, redness and burning sensations for from one to two minutes afterward. Under these circumstances it may be instilled once a day. The patient should be instructed that the swelling of the conjunctiva is necessary to the therapeutic action of the remedy and that no harm to the eye will ensue from its use.

In cases of corneal opacity ethylmorphin hydrochlorid has been applied to the eye in the form of powder. It may also be used as an ointment in strength varying from 1.5 to 5 per cent.

DOSAGE: 0.015 Gm. or ¼ grain.

Alcohol, Alcohol, U. S. P.—In European pharmacopeias alcohol is usually designated as Spiritus, and varies considerably in strength.

PROPERTIES: The official U. S. P. alcohol is a colorless volatile liquid containing about 94 per cent. by volume of absolute ethyl alcohol, C_2H_5OH, and 6 per cent. by volume of water. It has a characteristic odor and burning taste. It is miscible in all proportions with water, ether or chloroform. In addition to alcohol, the U. S. P. also describes dehydrated alcohol, used as a laboratory reagent, etc., and also diluted alcohol (approximately 50 per cent.) used in pharmacy as a menstruum.

ACTION AND USES: *Externally,* alcohol is a rubefacient and astringent, and by its evaporation, a refrigerant. It is used to harden and cleanse the skin; as a mild counter-irritant (soap liniment), etc. In the concentration of 70 per cent. it is markedly antiseptic and is employed in surgery especially as tincture of green soap, to cleanse the skin of patient and operator.

Internally, alcohol is a narcotic; excessive doses depress and paralyze the central nervous system. Small doses produce euphoria, stimulate respiration, moderately dilate the cutaneous and splanchnic vessels, and modify the circulation. It is burned in the body and thus serves to a restricted extent as a source of energy.

Alcohol is employed as a diffusible stimulant, diaphoretic and hypnotic. In well-selected cases, especially in patients accustomed to its use, it may be very valuable; otherwise it is apt to do more harm than good. In practice it is usually administered in the form of whisky, brandy, wine or other alcohol-containing beverages.

In pharmacy alcohol is used as a solvent and, for administering medicines, is largely used as a vehicle in the form of:

ELIXIR AROMATICUM (ELIX. AROM.), AROMATIC ELIXIR, *U. S. P.* (Simple Elixir).—An aromatic and sweetened *liquid* containing about 23 per cent. of alcohol, by volume.

Aloe, Aloes, U. S. P.—The inspissated juice of various species of *Aloe* is included in all the pharmacopeias. It is used in its original form, as a watery extract or as a purified extract known as aloin.

PROPERTIES: Aloes differs considerably in color and appearance, but in all its forms it has a rather characteristic odor and a nauseous, very bitter taste. Aloes is partially soluble in water.

ACTION AND USES: Aloes belongs to the emodin group of cathartics acting on the large intestine. It causes pelvic congestion and has an emmenagogue action. Its action is said to be enhanced by the addition of soap and iron. Its purgative action is slow, evacuation occurring only after some hours, the stools being soft, seldom watery.

Aloes is adapted to the treatment of constipation by daily laxative action, but should rarely be used as a purgative, because of its tendency to cause griping. Because of the pelvic congestion it produces, aloes is contra-indicated in pregnancy and in the presence of hemorrhoids. It is an appropriate remedy in functional amenorrhea if the production of pelvic congestion is deemed advantageous.

DOSAGE: The purgative dose of aloes is from 0.15 to 0.3 Gm. or from 2 to 5 grains. For the treatment of chronic constipation smaller doses, 0.03 to 0.5 Gm. or ½ to 1 grain, should be used. A preparation of belladonna is frequently combined with it on purely theoretical grounds and without demonstrated advantage. It is more than possible that the habitual use of belladonna augments the tendency to constipation.

EXTRACTUM ALOES (EXT. ALOES), EXTRACT OF ALOES, N. F.

DOSAGE: 0.125 Gm. or 2 grains.

Aloinum (Aloin.), Aloin, U. S. P.—A pentosid or mixture of pentosids obtained from aloes.

DOSAGE: Purgative dose 0.015 Gm. or ¼ grain. In the treatment of chronic constipation aloin is frequently given in doses of from 0.005 to 0.02 Gm. or 1/12 to ⅓ grain in combination with extract of belladonna and strychnin. It may be taken after supper or at bedtime; if at bedtime, with plenty of water and a cracker, or at least with some food.

Alumen (Alum.), Alum, U. S. P.—Crystallized ammonium or potassium aluminum sulphate, $AlNH_4(SO_4)_2+12H_2O$ or $AlK(SO_4)_2+12H_2O$.

PROPERTIES: Alum occurs as colorless crystals or a white powder without odor, but having a strongly astringent taste. It is freely soluble in water, practically insoluble in alcohol. It contains about 45 per cent. of water of hydration, which can be removed by heat, the product being exsiccated alum.

INCOMPATIBILITIES: Alum is incompatible with alkalies *and carbonates,* which react with it with the formation of *insoluble aluminum* hydroxid. It is also incompatible with

salts of lead because it precipitates the insoluble lead sulphate.

ACTION AND USES: Alum is astringent, styptic and hemostatic, but is seldom administered internally.

DOSAGE: Alum solution may be used as a gargle (from 1 to 5 per cent.) but it is somewhat injurious to the teeth; it may be given as an injection in gonorrhea (from 0.5 to 1 per cent.) and as a lotion in skin diseases (1 per cent.).

ALUMEN EXSICCATUM (ALUM. EXSIC.), EXSICCATED ALUM, U. S. P.—A powder representing about twice its weight of the crystallized alum; it is sometimes used externally as a dusting powder or in the form of ointments.

Alumini Acetas, Aluminum Acetate.—Used principally in the form of:

LIQUOR ALUMINI SUBACETATIS (LIQ. ALUMIN. SUBACET.), SOLUTION OF ALUMINUM SUBACETATE, N. F.—Described in the National Formulary III under the name of Liquor Alumini Acetatis.

PROPERTIES: A clear, colorless solution, containing from 7.5 to 8 per cent. of basic aluminum acetate, having an acetous odor and a sweetish, astringent taste.

ACTION AND USES: Solution of aluminum subacetate is used extensively as a mild astringent and antiseptic. Because of the readiness with which this solution is decomposed it is advisable to dilute it with water only. For application to the skin it should be diluted from four to nine times.

Ammonia.—NH_3. An irritating gas, soluble in alcohol, and in water, in which a part is converted into NH_4OH. Water of ammonia and the several preparations containing it are strongly alkaline.

INCOMPATIBILITIES: It is incompatible with acids, neutralizing them and forming the salts of ammonium. It is also incompatible with the soluble salts of many metals because it precipitates from these solutions the hydroxids of the metals. Thus ammonia water with solution of ferric chlorid produces an insoluble precipitate of ferric hydroxid. Solutions of ammonia are also incompatible with the salts of alkaloids, from which they liberate the alkaloid.

ACTION AND USES: Ammonia internally in the form of water of ammonia or of aromatic spirit of ammonia is stimulant, because the escaping ammonia irritates the mucous membranes of the nose and of the stomach and causes a reflex increase in the force of the heart and in the blood-pressure. Little, if any, of the gas is absorbed by the respiratory tract.

Externally, ammonia is used as a counterirritant. It *reddens the* skin but does not blister, unless applied in *concentrated* solution.

AQUA AMMONIAE (AQ. AMMON.), AMMONIA WATER, U. S. P.—An aqueous solution, containing about 10 per cent. by weight of ammonia (NH_3). On standing, this solution loses ammonia and hence should be kept in well-stoppered bottles and should frequently be tested by the pharmacist. Ammonia water is a colorless liquid, having a very pungent, characteristic odor and a caustic, soapy taste. It is freely miscible with water and alcohol. Ammonia water is used chiefly for counterirritation in the form of:

LINIMENTUM AMMONIAE (LIN. AMMON.), AMMONIA LINIMENT, U. S. P. (Volatile Liniment, Hartshorn Liniment).—A mixture of ammonia water 25 parts and a fatty oil 75 parts.

AMMONIUM COMPOUNDS.—Ammonium compounds are divisible into two classes. In the first class the ammonium is combined with a strong acid such as hydrochloric or sulphuric. These form stable, neutral salts which act largely by their salt action. In the second class belong ammonium hydroxid and carbonate. These compounds are unstable, decomposing readily with liberation of ammonia. Such compounds produce reflex effects by the irritating action of the ammonia evolved. All ammonium compounds used in medicine are soluble in water and the carbonate and hydroxid have a strong alkaline reaction.

ACTION AND USES: *Ammonium salts,* when injected into the circulation, stimulate the central nervous system, but they are so rapidly excreted or converted into urea that they cannot produce systemic action when taken by mouth, even though they are absorbed very readily. Their effects are, therefore, entirely local. Ammonium acetate was formerly believed to be diaphoretic, but probably has little value.

The neutral salts are rather irritant, and thus cause a mild stimulation of the mucous membranes, explaining the use of ammonium chlorid as an expectorant. With ammonium carbonate, this effect is reinforced by its alkaline reaction, through which it is supposed to liquefy and dissolve mucus.

Ammonii Acetas, Ammonium Acetate.—Used chiefly in the form of:

LIQUOR AMMONII ACETATIS (LIQ. AMMON. ACET.), SOLUTION OF AMMONIUM ACETATE, U. S. P. (Spirit of Mindererus).—An aqueous solution containing about 7 per cent. of ammonium acetate, $NH_4(CH_3.COO)$. It is made by dissolving ammonium carbonate in diluted acetic acid. It is a clear, colorless liquid, having a mildly saline, acidulous taste and an acid reaction. It is incompatible with *alkaline hydroxids* and carbonates, which liberate ammonia.

ACTION AND USES: Solution of ammonium acetate is used in fevers and infections to promote sweating, but, as previously stated, it is of little value.

DOSAGE: 15 Cc. or 4 fluidrams, which can be repeated once in two or three hours.

Ammonii Carbonas (Ammon. Carb.), Ammonium Carbonate, U. S. P.—Consists of a mixture of ammonium acid carbonate and ammonium carbamate.

PROPERTIES: It occurs as white, hard masses, having a strong odor of ammonia and a sharp, saline taste. On exposure to the air the salt loses both ammonia and carbon dioxid. Ammonium carbonate is slowly but freely soluble in water (1: 4), the ammonium carbamate being thereby converted into normal ammonium carbonate. Alcohol dissolves the carbamate and leaves the acid carbonate.

INCOMPATIBILITIES: Ammonium carbonate is incompatible with acids, which decompose it, forming salts of ammonium and evolving carbon dioxid (CO_2). It precipitates the carbonate or the hydroxid of most metals and the insoluble alkaloids from solutions of their salts.

ACTION AND USES: Ammonium carbonate is largely decomposed (hydrolyzed) when dissolved in water, and its solutions are irritant to mucous membranes from the action of the ammonia set free. It is used by inhalation or in solutions as a reflex or diffusible stimulant in syncope, or arrest of respiration, and as a liquefying expectorant in bronchitis.

DOSAGE: 0.3 Gm. or 5 grains, dissolved in sufficient water (about one tablespoonful) to avoid too great irritation, which may result in nausea and vomiting. On the other hand, as the action of the remedy depends on its irritating qualities, it should not be too greatly diluted.

SPIRITUS AMMONIAE AROMATICUS (SP. AMMON. AROM.), AROMATIC SPIRIT OF AMMONIA, U. S. P.—A solution of ammonium carbonate with some free ammonia and aromatic oils in a mixture of distilled water with alcohol.

ACTION AND USES: A useful indirect stimulant, having the action and uses of ammonium carbonate combined with those of the alcohol and volatile oils.

DOSAGE: From 1 to 5 Cc. or 15 to 60 minims, suitably diluted with water. As the stimulating action is of short duration a moderate dose may be repeated in from fifteen minutes to half an hour.

Ammonii Chloridum (Ammon. Chlor.), Ammonium Chlorid, U. S. P.—NH_4Cl.

PROPERTIES: Ammonium chlorid usually occurs as a white, crystalline powder, without odor, having a cooling, saline taste. It is freely soluble in water (1: 2.6), and soluble in alcohol (1: 100), its aqueous solutions being neutral or very slightly acid to litmus.

INCOMPATIBILITIES: Ammonium chlorid is incompatible *with alkaline* hydroxids and carbonates, which liberate

ammonia. It precipitates the insoluble chlorids of silver and of lead from solutions of the salts of those metals.

ACTION AND USES: Ammonium chlorid is said to be absorbed more quickly than any other salt. Its principal activity is as an expectorant, though it is slightly diuretic and diaphoretic. Its vapors have been used for inhalation in cases of nasopharyngeal catarrh and as an expectorant in bronchitis. For this purpose it may also be generated in a special apparatus by the union of the vapors of strong hydrochloric acid and ammonia water.

DOSAGE: From 0.30 to 1 Gm. (from 5 to 15 grains), repeated every two or three hours, or less frequently, depending on the size of the dose.

Its taste is best concealed or modified by administering it in a sour mixture as:

	Gm.	or	Cc.	
℞ Ammonii chloridi	5			ʒ iss
Syrupi acidi citrici	50	or		fl. ʒ ii
Aquae q. s. ad	100			fl. ʒ iv

M. et Sig.: A teaspoonful, in water, every two hours.

To the preceding prescription codein sulphate may be added, if desired. The amount of citric acid should be diminished when the prescription is for a child, and after the child has taken a dose of it he may be given a piece of chocolate or a simple peppermint or wintergreen lozenge.

Amylis Nitris (Amyl. Nitris), Amyl Nitrite, U. S. P.—A liquid containing about 80 per cent. of $C_5H_{11}NO_2$ (chiefly iso-amyl nitrite). It should be kept in hermetically sealed glass bulbs or in dark, amber-colored, glass-stoppered vials, in a cool, dark place.

PROPERTIES: Amyl nitrite is a clear, yellowish liquid of a peculiar, ethereal, fruity odor and a pungent, aromatic taste. It is very volatile even at low temperatures, and is inflammable. It is practically insoluble in water, but miscible in all proportions with alcohol or ether.

ACTION AND USES: The nitrites used in medicine are certain salts or esters of nitrous acid and possess a common pharmacologic action. This group also includes certain organic nitrates which are reduced to nitrites in the organism. The chief members are amyl nitrite, sodium nitrite and glycerol nitrate (glyceryl trinitrate or nitroglycerin).

The characteristic action of this group is vasodilatation with a fall of the blood-pressure. The members differ chiefly in the rapidity and duration of their effects, amyl nitrite being the quickest, though its action is of correspondingly short duration.

When given by inhalation, amyl nitrite produces an almost instantaneous dilatation of the peripheral blood-vessels, shown by redness of the skin beginning in the head and neck, rapidly spreading over the body and sometimes extending to the lower extremities. This is promptly followed by a dilatation of the splanchnic and other vessels

so that the blood-pressure soon falls. The lowered pressure increases the heart-rate. There is a feeling of fulness in the head, often accompanied by headache. The breathing is rapid. With excessive doses unconsciousness may supervene, and convulsions may occasionally occur after toxic doses. Large doses kill by respiratory paralysis. It may produce methemoglobin in the blood and cause the excretion of sugar in the urine. As much as 0.6 Cc. may generally be inhaled without dangerous results.

The effects of the medicinal administration of amyl nitrite are very transient. It is employed to relieve spasm in epilepsy, sometimes averting an expected paroxysm. It is also used to relax the spasm of the blood-vessels in angina pectoris and in other painful affections in which there is reason to believe that the pain depends on arterial spasm.

Amyl nitrite is given to reduce the blood-pressure in cases in which hemorrhage is due to the rupture of a blood-vessel in the lungs, brain or other organ in consequence of elevated blood-pressure, but in hemorrhage with normal blood-pressure it may do harm. It has been used with favorable results in bronchial asthma.

DOSAGE: 0.2 Cc. or 3 minims, by inhalation. It is conveniently carried in the form of glass pearls, each pearl containing a dose. When required the pearl is crushed in the handkerchief and the contents inhaled.

Amylum (Amyl.), Starch, U. S. P. (Corn-Starch).—The starch grains obtained from the grain of *Zea mays.*

PROPERTIES: Starch occurs in the form of fine powder or irregular, angular, white masses, insoluble in both water and alcohol, but swelling into a colloidal "paste" when boiled in water.

ACTION AND USES: Dry starch is used as a dusting and drying powder and also as a diluent for other more active substances. The gelatinous mass produced on boiling with water or glycerin is employed as an emollient and protective; as a cataplasm, and as an antidote to iodin poisoning. The starches from other cereals, from cassava and the potato have practically the same medicinal properties as corn-starch.

Antimonii et Potassii Tartras (Antim. et Pot. Tart.), Antimony and Potassium Tartrate, U. S. P. (Antimonyl Potassium Tartrate, Tartrated Antimony, Tartar Emetic).—A double salt of antimony and potassium with the radical of tartaric acid.

PROPERTIES: It occurs as a white powder or as colorless transparent crystals, becoming white and opaque on exposure to the air. It is soluble in water (1: 12), but practically insoluble in alcohol.

INCOMPATIBILITIES: It is incompatible with alkalies and their carbonates, tannic acid and astringent preparations generally.

ACTION AND USES: Antimony and potassium tartrate, *when applied* to the skin, gives rise slowly to inflammatory

changes, with pustules, followed by ulceration, which is somewhat difficult to limit. The ointment formerly employed as a pustulant counterirritant is now rarely used.

Internally antimony and potassium tartrate produces local irritation of the gastro-intestinal tract, and thereby nausea and vomiting with marked prostration. If absorbed, symptoms very similar to those produced by poisonous doses of arsenic are observed.

The therapeutic uses of tartar emetic are almost entirely confined to the treatment of the first stage of acute laryngitis and bronchitis. It should be avoided in cases marked by depression. When it is given, the object should be to increase secretion and facilitate the expulsion of sputum. The administration of tartar emetic should not be carried beyond the production of slight nausea. For the production of vomiting other agents are preferable.

DOSAGE: As an expectorant small doses should be used, beginning with 0.001 Gm. or 1/60 grain, which may be repeated hourly, taking care to avoid too great depression. The emetic dose is 0.03 Gm. or ½ grain.

VINUM ANTIMONII (VIN. ANTIMON.), WINE OF ANTIMONY, N. F.—One hundred Cc. contain 0.4 Gm. of antimony and potassium tartrate in sherry wine. This preparation is practically identical with the antimonial wine official in other countries.

DOSAGE: 1 Cc. or 15 minims, equivalent to 0.004 Gm. or 1/15 grain of antimonium and potassium tartrate. As an expectorant smaller doses such as 0.2 Cc. or 3 minims should be employed.

Antipyrina (Antipyr.), Antipyrin, U. S. P.—This substance is described in the British Pharmacopeia as phenazonum and in the German Pharmacopeia as pyrazolonum phenyldimethylicum.

PROPERTIES: Antipyrin occurs as a colorless, almost odorless, crystalline powder or tabular crystals having a slightly bitter taste. It is very soluble in water and freely soluble in alcohol (1: 1.3).

INCOMPATIBILITIES: Antipyrin in incompatible with spirit of nitrous ether, or other nitrites, tannic acid and tannic-acid-containing preparations. Mixed dry with sodium salicylate, it liquefies on standing.

ACTION AND USES: Antipyrin is an antipyretic and analgesic, acting similarly to acetanilid.

It is used for the relief of pain, chiefly when of a neuralgic character, also as an antispasmodic in pertussis. It is not suited to the treatment of the pain caused by inflammation.

Antipyrin is now seldom used as an antipyretic. Because of its rapid and at times erratic action it is not a safe ingredient of preparations sold directly to the laity. *Locally, it is used sometimes* as a hemostatic.

DOSAGE: 0.25 Gm. or 4 grains, given with even greater caution than acetanilid and acetphenetidin. It is best administered alone in simple solution, or in powders, capsules or cachets.

Apomorphinae Hydrochloridum (Apomorph. Hydrochl.), Apomorphin Hydrochlorid, U. S. P.—The hydrochlorid of an artificial alkaloid prepared from morphin by the abstraction of one molecule of water.

PROPERTIES: Apomorphin hydrochlorid occurs as minute, white or grayish-white crystals, having a slightly bitter taste and acquiring a greenish tint on exposure to light and air. It is soluble (1: 50) in both water and alcohol. If the salt imparts at once an emerald-green color to 100 parts of water it should be rejected. The amorphous form may contain dangerous impurities.

INCOMPATIBILITIES: It is precipitated by alkalies and the alkaloidal reagents. Solutions decompose rather readily.

ACTION AND USES: The chief action of apomorphin is the production of vomiting with its usual accompanying symptoms, including nausea with increase of saliva and other secretions, depression of the circulation, sweating, etc. It sometimes produces respiratory paralysis, even in small doses.

The drug is used chiefly as an emetic. For this purpose it has the advantage that it acts on the vomiting center, independently of a local action on the stomach. It produces a prompt emptying of the stomach with little subsequent sickness, unless the dose is large. It is therefore a useful emetic in poisoning, if the stomach-tube cannot be employed. It has been advised for the expulsion of foreign bodies from the air-passages. As an expectorant it is inferior to other nauseants.

It is said to be sometimes useful in asthma. Small doses (0.002 Gm., 1/30 grain) are hypnotic, especially in acute alcoholism.

DOSAGE: The emetic dose is 0.005 Gm. or 1/12 grain, given preferably by hypodermic injection. This may be repeated at ten-minute intervals until effective, but it should be remembered that in some cases apomorphin produces toxic effects without causing vomiting, and a dose of 0.004 Gm. or 1/15 grain is said to have produced death in a person enfeebled by chronic bronchitis; 0.012 Gm. or 1/6 grain may be given to robust patients at the first dose if the urgency of the case demands it, but care should be exercised in the use of these doses.

As an expectorant the proper dose is from 0.001 Gm. to 0.002 Gm. or from 1/60 to 1/30 grain, repeated once an hour or once in two hours, with the avoidance of more than slight nausea.

Aqua, Water, U. S. P.—Water used for medicines should be sterile; it is preferable to use:

AQUA DESTILLATA (AQ. DEST.), DISTILLED WATER, U. S. P.—*A colorless*, limpid liquid, without odor or taste, and

perfectly neutral to the official indicators. For some purposes (in making solutions of salvarsan, for example), it is essential that it be freshly distilled. Ordinary distilled water frequently is not sterile.

AQUAE AROMATICAE, AROMATIC WATERS.—The official aromatic waters are aqueous solutions of volatile substances, usually volatile oils. They are used as vehicles for the more active, water-soluble drugs. For preparations included in this list see:

AQUA AMMONIAE, under **Ammonia.**

AQUA CAMPHORAE, under **Camphora.**

AQUA CHLOROFORMI, under **Chloroformum.**

AQUA CINNAMOMI, under **Cinnamomum.**

AQUA MENTHAE PIPERITAE, under **Mentha Piperita.**

AQUA ROSAE, under **Rosa.**

Argenti Nitras (Arg. Nit.), Silver Nitrate, U. S. P.—$AgNO_3$.

PROPERTIES: Silver nitrate occurs in colorless, crystalline tables, becoming gray, or grayish black on exposure to light in the presence of organic matter. It is odorless and has a bitter, caustic, and strongly metallic taste. It is very soluble in water (1: 0.4) and soluble in alcohol (1: 30).

INCOMPATIBILITIES: Silver nitrate is incompatible with soluble chlorids, bromids and iodids, with which it forms the corresponding very insoluble salts of silver. It is also incompatible with soluble carbonates and hydroxids, which precipitate the oxid of silver, and with all organic drugs and reducing agents.

ACTION AND USES: Silver nitrate is an antiseptic and germicide, in solutions of a strength of 1: 1,000 destroying many micro-organisms, and in a strength of 1: 10,000 preventing their growth. Weak solutions are astringent to mucous membranes and strong solutions are caustic when applied to mucous membranes, denuded surfaces, and, in some cases, to the normal skin. When taken internally silver nitrate is believed to hinder the secretion of the gastric juice, especially when the degree of acidity is excessive.

Silver nitrate is used as a mild caustic to wounds, ulcers and exuberant granulations. It is applied as an astringent and antiseptic in catarrhal infections of the mucous membranes.

Internally it is sometimes employed as an astringent in diarrhea, but its use for this purpose is not to be recommended. It has been advised for the treatment of gastric ulcer and to reduce the gastric secretion in hyperchlorhydria. Its internal use for some time may be followed by its deposition in the skin, producing the condition known as argyria.

DOSAGE: As a caustic, silver nitrate is used in the form *of fused silver nitrate.* This should be moistened before

used and should be held with forceps or in a suitable holder. Care should be taken to limit its action to the affected part.

In applications to mucous membranes the following strengths of solution in water are most suitable:

To the conjunctiva a strength of 4 per cent. may be applied in small quantity and the action stopped by addition of solution of sodium chlorid. This method of use is applicable to cases of severe conjunctivitis, especially those of gonorrheal origin.

For the prevention of gonorrheal conjunctivitis in the new-born a drop of 2 per cent. solution should be instilled into the eye as soon as practicable after delivery.

For other diseases of the conjunctiva, solutions varying in strength from 0.2 to 2 per cent. are sometimes used, but it is probable that other astringents are safer and quite as useful.

To the larynx, application is made of solutions containing from 2 to 10 per cent. of silver nitrate.

For the urethra, it is employed in the strength of from 1:10,000 to 1:2,000, and a solution of the strength of 1:5,000 may be injected into the bladder. A solution of from 1:2,000 to 1:1,000 is used as a gastric douche in hyperchlorhydria and gastric ulcer, followed after two minutes by a solution of sodium chlorid which is thoroughly mixed with the silver solution and then washed out of the stomach.

Solutions of silver nitrate should always be made with distilled water, and the mucous membranes to which they are to be applied should receive a preliminary cleansing to remove mucus, pus, food, etc., which might interfere with the action of the silver nitrate. The action may be stopped by sodium chlorid solution.

Internally the salt may be given in pill form, preferably mixed with kaolin and massed with petrolatum. The average dose is 0.01 Gm. or ⅙ grain. This dose may also be given in solution when the direct effect on the stomach is desired. If the stomach contains hydrochloric acid the silver salt would be converted into silver chlorid; hence silver nitrate should be given on an empty stomach.

Argenti Nitras Fusus (Arg. Nit. Fus.), Molded Silver Nitrate, U. S. P., (Lunar Caustic, Fused Silver Nitrate).—A white, hard solid generally in the form of pencils or cones. A small amount of silver chlorid is added in the process for the purpose of toughening the mass.

Argenti Proteinas, Silver Proteinate.—See **Protargol.**

Aristol.—See **Thymolis Iodidum.**

Arseni Trioxidum (Arsen. Triox.), Arsenic Trioxid, U. S. P. (Arsenous Oxid, White Arsenic).—As_2O_3, formerly official as arsenous acid.

PROPERTIES: Arsenic trioxid occurs as an opaque, white powder or in irregular masses of two varieties, one amorphous, transparent and colorless like glass, the other crystalline, opaque and white, resembling porcelain. Arsenic trioxid is very slowly soluble in water (1: 30 to 1: 100) and practically insoluble in alcohol. It dissolves quite readily in solutions of acids or alkalies.

INCOMPATIBILITIES: Solutions of arsenic are incompatible with salts of iron and of magnesium, lime-water and vegetable astringents.

ACTION AND USES: Local External Effects and Uses: Arsenic trioxid applied to denuded or ulcerated tissue has a mildly caustic action which is quite painful. It has been used as a caustic, especially to malignant growths, but the painful character of the applications, the danger of absorption, and the uncertain extent of the destructive action have justly limited its use.

Internal Actions: Arsenic trioxid irritates the mucous membrane of the stomach and intestines. Toxic doses cause nausea, vomiting, colicky pains in the abdomen, a diarrhea of a watery character resembling that of cholera, and fatty degeneration of the liver and other internal organs. Large doses produce great depression, and collapse may ensue.

Arsenic in therapeutic doses is employed in the treatment of neuralgia. It is thought to be especially adapted to cases of a periodic charactedr. It is also used in the treatment of chorea. Larger doses, especially if long continued, may cause peripheral neuritis. Arsenic stimulates the action of the blood-forming organs, especially the bone-marrow. It is especially useful in the treatment of pernicious anemia, leukemia and Hodgkin's disease. In these diseases it must be used in as large doses as can be borne. While improvement occurs in these conditions under the use of arsenic it is usually only temporary.

Many skin-diseases are favorably influenced by proper doses of arsenic. It acts by stimulating the skin, in such cases as usually require external stimulating applications. It is also of service in lesions due to disturbances of innervation in which the skin is usually poorly nourished. The following skin affections may be mentioned as likely to be benefited by arsenic: psoriasis, lichen planus, chronic eczema, pemphigus, dermatitis herpetiformis, chronic urticaria and disturbances of the sweat function. On the other hand, acute inflammatory conditions of the skin are made worse by arsenic.

Arsenic is recommended in chronic bronchitis and emphysema. It has been used apparently with good results in tuberculosis. Too great dependence, however, should not be placed on it in the latter affection. It is used in asthma by way of the stomach and in the form of cigarettes.

Arsenic is a powerful remedy against protozoal affections. These include malaria, syphilis and relapsing fever. In the form of arsenic trioxid it has been used successfully in *malaria, particularly* in the chronic form and in malarial *cachexia.* *See* **Salvarsan.**

DOSAGE: For ordinary affections of metabolism or for a tonic influence the dose may vary from 0.001 to 0.002 Gm. or 1/60 to 1/80 grain. In diseases of the blood the dosage should be regulated according to the effect, but it is well to use as large doses as the patient will tolerate. Arsenic may be used in increasing doses until symptoms of mild intoxication appear. One may begin with 0.003 Gm. or 1/20 grain of arsenic trioxid three times daily, and increase by 0.001 Gm. or 1/60 grain three times daily. In using Fowler's solution the initial dose may be 3 minims three times daily and increase by 1 minim three times daily. A slight toxic action is indicated by nausea, colicky pains or a puffiness under the eyes. The presence of albumin in the urine may also be observed. Such symptoms may make advisable the temporary withdrawal of the remedy.

LIQUOR POTASSII ARSENITIS (LIQ. POT. ARSEN.), SOLUTION OF POTASSIUM ARSENITE, U. S. P. (Fowler's Solution, Liquor Arsenicalis Fowleri, P. I.).—An aqueous solution containing potassium arsenite, corresponding to about 1 per cent. of arsenic trioxid.

DOSAGE: 0.2 Cc. or 3 minims.

This solution is often somewhat alkaline and is therefore incompatible with alkaloidal salts.

LIQUOR ACIDI ARSENOSI (LIQ. ACID. ARSEN.), SOLUTION OF ARSENOUS ACID, U. S. P. (Hydrochloric Solution of Arsenic, "Solution of Arsenic Chlorid").—An aqueous solution containing the equivalent of 1 per cent. of arsenic trioxid with 5 per cent. of hydrochloric acid.

DOSAGE: 0.2 Cc. or 3 minims.

LIQUOR ARSENI ET HYDRARGYRI IODIDI (LIQ. ARSEN. ET HYDRARG. IOD.), SOLUTION OF ARSENOUS AND MERCURIC IODID, U. S. P. (Donovan's Solution).—Represents about 1 per cent. of arsenous iodid and 1 per cent. of mercuric iodid.

DOSAGE: 0.1 Cc. or 1½ minims.

Asafoetida (Asafoet.), Asafetida, U. S. P. (Gum Asafetida).—A gum resin obtained from the roots of *Ferula Asafoetida* and probably other species of *Ferula.*

PROPERTIES: A good quality of asafetida should contain not less than 60 per cent. of matter soluble in alcohol and should yield not more than 15 per cent. of ash. The gum of asafetida is freely soluble in cold or hot water and is present in sufficient amount to suspend in the form of a permanent emulsion the accompanying resin and volatile oil.

ACTION AND USES: Asafetida is used in the treatment of hysteria, acting probably by its odor. It is also carminative.

DOSAGE: 0.25 Gm. or 4 grains—preferably in pill form. In *tympanites* an emulsion may be used as an enema. The *emulsion is* made by triturating 4 Gm. of a good quality of

the drug with 100 Cc. of water until a uniform emulsion results. The strength may be varied to meet individual requirements.

Aspidium, Aspidium, U. S. P. (Male Fern).—The dried rhizome of several species of *Dryopteris;* used only in the form of:

OLEORESINA ASPIDII (OLEORES. ASPID.), OLEORESIN OF ASPIDIUM, U. S. P. (Oleoresin of Malefern).—An oleoresin prepared by extracting aspidium with ether, evaporating and recovering the solvent.

PROPERTIES: The most important constituent of male fern is filicic acid.

ACTION AND USES: Ordinarily the active constituents of aspidium are not absorbed and produce no symptoms except some nausea. If absorption occurs, violent symptoms of poisoning may ensue. The symptoms are excessive vomiting and purging, great weakness, spasms in the extremities, convulsions, stupor deepening into coma and collapse. Disturbances of sight and hearing may occur and permanent blindness sometimes follows. Jaundice has been observed.

Oleoresin of aspidium is used as a teniacide against ordinary tapeworm, but it is said to be more efficient against the *Bothriocephalus* than against ordinary tenias.

DOSAGE: 2 Gm. or 30 grains is the dose stated in the Pharmacopeia, but most authorities recommend a larger dose. The dose should be proportioned to the strength and health of the patient. Robust males can take as much as 8 Gm. or 2 fluidrams, while women should be given smaller doses and special caution should be exercised in administering the drug to anemic or debilitated persons. Children of 4 years may take 4 Gm. or 60 grains.

Before this remedy is given, the alimentary canal should be emptied by a light diet or fasting for twenty-four hours and the administration of a saline cathartic in the morning before the anthelmintic is given. The drug should be given early in the morning and is best directed to be taken in capsules containing 0.3 Gm. or 5 grains, or in the form of emulsion. The total quantity may be given in divided doses at intervals of fifteen minutes and the last dose followed in three hours by a saline laxative. Castor oil or other fixed oils should not be given, because they favor the absorption of the active principle.

A dose of 8 Gm. or 2 drams has been fatal to a child and 25 Gm. or 6 drams have several times proved fatal to adults.

Atophan.—See **Acidum Phenylcinchoninicum, U. S. P.**

Atoxyl.—See **Sodii Arsanilas.**

Atropina (Atrop.), Atropin, U. S. P.—An alkaloid obtained from *Atropa Belladonna* and from other plants of the *Solanaceae.*

PROPERTIES: The alkaloid itself is only slightly soluble in water (1: 445), but freely soluble in alcohol (1: 2), and is usually prescribed in the form of one of its salts, which are readily soluble in water.

INCOMPATIBILITIES: Solutions of atropin are stated to be incompatible with alkalies. While no precipitate of the alkaloid would form, unless the solution were more concentrated than those ordinarily used in medicine, the alkaloid in the presence of alkalies is likely to be decomposed.

Solutions of the alkaloid are also incompatible with tannic acid, with Lugol's solution, and with potassiomercuric iodid, which precipitate compounds of the alkaloid, and with salts of mercury, such as the chlorid, which decomposes it.

ACTION AND USES: Atropin and the related alkaloids depress or paralyze the endings of the vagus and other nerves of the autonomic system and of the nerves supplying the sweat glands.

The alkaloid produces a cerebral stimulation which shows itself by quickened thought and speech, eventuating in a peculiar talkative delirium with hallucinations. Larger doses produce unconsciousness and occasional convulsions.

Atropin checks the secretion of saliva so that the mouth and throat become dry. This dryness is due to some extent to a similar effect on the mucous secretions of the mouth, throat and nose. As an application of this action, the drug is occasionally used to check excessive secretion of saliva in ptyalism, mercurial salivation, etc. It is also used in coryza, especially in the first stage, to lessen the congestion and excessive secretion of the nasal mucus. It is held by some to be very useful in sore throat. It is used in case of excessive expectoration in bronchitis, bronchorrhea, etc. It also checks the secretion of saliva and mucus during anesthesia in operations of the throat, larynx, etc.

Atropin lessens the secretion of hydrochloric acid by the stomach. It is given for this purpose in hyperchlorhydria, gastric ulcer, etc. While it has a decided effect on the secretion, its use should not be continued for a long time. It lessens the secretion of the pancreatic juice, or at least prevents the increase that follows the ingestion of physostigmin and other drugs, but does not prevent the action of secretin. It abolishes the secretion of that part of the bile which is under vagus control, but this action is probably unimportant. It is said not to affect the secretion of intestinal mucus. It relaxes spasm of the intestinal musculature and in small doses favors the normal peristalsis. It is therefore of great service in spasmodic affections of the stomach and intestine. It may be prescribed in colic, painful spasms due to gastric, duodenal or intestinal ulcers, spastic constipation, etc. It is a serviceable anodyne in gall-stone colic and may render the use of morphin unnecessary.

In small or moderate doses it acts as a respiratory stimulant, but very large doses cause respiratory paralysis. It may be employed with good effect in cases in which the

respiration is embarrassed from other than mechanical agents. It is used for this purpose in morphin poisoning, but it should be administered with great care on account of the respiratory depression caused by large doses. To obviate the effect of morphin on the respiration it is given with the latter drug in hypodermic injections. It has also been given with morphin as a preliminary to anesthesia by ether; in such cases it also serves to lessen the salivary and bronchial secretions.

By paralyzing the vagus endings atropin increases the rapidity of the heart-beat. Its depressant action on the vagus is made use of in the diagnosis of certain disturbances of the cardiac rhythm, particularly bradycardia. If the slow pulse is due to an organic lesion of the conducting mechanism (heart-block), it will persist in spite of the action of atropin, but if it is due to vagal stimulation, an increased rate usually results from an effective dose.

Atropin in moderate doses relaxes the blood-vessels of the skin so that the skin, especially of the face and upper extremities, becomes red, sometimes showing an eruption closely resembling that of scarlet fever. In larger doses it contracts the vessels of the splanchnic area and raises the blood-pressure. In still larger doses a general fall of blood-pressure occurs, accompanied by a very rapid and feeble pulse. It is not, however, an essential heart tonic.

The secretion of sweat is reduced by atropin. It is used for the suppression of night sweats, especially in pulmonary tuberculosis. A simple dose given at night may be followed the next night by a larger dose if the first was not successful. The use of atropin for this purpose should be deferred as long as practicable and discontinued as soon as may be on account of disturbing influence on digestion.

Atropin produces dilatation of the pupil, paralysis of the accommodation and consequent disturbance of vision by a local action on the oculo-motor nerve endings in the iris. When the drug is taken internally the effect is due to the atropin circulating in the blood, and is bilateral. When the drug is applied locally the action is unilateral unless some general absorption takes place or some of the solution is introduced into the other eye by accident.

To produce these actions, atropin is employed in solution dropped into the conjunctival sac for the purpose of facilitating the examination of the eye with the ophthalmoscope. The dilatation of the pupil also serves as a diagnostic measure in case of iritis as the pupil dilates irregularly in this disease. The wide dilatation of the pupil also tends to prevent its adhesion to the cornea or lens.

Sufficient absorption may take place from lotions dropped into the conjunctiva to produce general symptoms and even to cause toxic effects. Atropin may also provoke acute glaucoma.

Atropin is sometimes used externally in the form of ointment of belladonna for the relief of certain forms of neuralgia, especially those in which pain results from local

conditions of the nerve or surrounding tissues. It has been advised for local use in the rectum to relieve the pain of hemorrhoids or fissure. It is an old remedy for enuresis. but must be regarded in most cases as a purely empirical treatment to be used after investigation has shown the absence of organic lesions which may be remedied in other ways. It is used for vesical spasm due to irritable neck of the bladder.

While the influence of atropin on the secretion of milk is not entirely established, it is quite generally used locally in mammitis, galactorrhea and when it is desired to check the secretion.

DOSAGE: Unpleasant symptoms indicating the beginning of its physiologic effects are produced in some people by 0.5 mg. or $\frac{1}{125}$ grain. It is best, therefore, to begin with half this dose, 0.25 mg. or $\frac{1}{250}$ grain. Doses can be repeated once in two hours until distinct physiologic effects are produced. For the treatment of the stomach the remedy should be given in solution about fifteen minutes before the meal. For action on the bowels it is commonly given at bedtime. The same time is also chosen when giving it for night sweats.

When atropin is being administered the patient or his friends should be warned of the possible appearance of slight toxic symptoms. The first indication is usually dryness of the throat. Some dimness of vision is also likely to be experienced.

Serious poisoning usually begins with rapid pulse, flushing of the skin, talkative delirium, marked dilatation of the pupils, some elevation of the temperature and dryness of the throat and skin. This is followed more or less quickly by unconsciousness, prostration, paralysis of the voluntary muscles and marked vasomotor paralysis.

Atropinae Sulphas (Atrop. Sulph.), Atropin Sulphate, U. S. P. —The sulphate of the alkaloid atropin.

PROPERTIES: Atropin sulphate occurs as a white, crystalline powder or microscopic crystals which are odorless, but have a very bitter, nauseating taste. Atropin sulphate is very soluble in water (1: 0.4) and in alcohol (1: 5).

INCOMPATIBILITIES: Atropin sulphate is incompatible with alkalies and their carbonates and with the precipitants of alkaloids generally.

DOSAGE: 0.5 mg. or $\frac{1}{120}$ grain. See **Atropin.**

BACTERIAL VACCINES.—See **VACCINA.**

Balsamum Peruvianum (Bals. Peruv.), Balsam of Peru, U. S. P. (Peru Balsam).—A balsam obtained from a tree, *Toluifera Pereirae.*

PROPERTIES: Balsam of Peru occurs as a viscid, dark brown liquid that does not harden on exposure to air. It contains traces of cinnamic and benzoic acids and their esters and resins.

ACTION AND USES: Balsam of Peru is not used internally, but is sometimes applied in ointment or in the form of alcoholic solution or mixed with castor oil as a stimulant to indolent wounds and ulcers to promote the formation of granulations and the process of cicatrization. Balsam of Peru is much used as a parasiticide in diseases of the skin, such as scabies.

In scabies a 4 per cent. petrolatum ointment of balsam of Peru, with the same amount of sulphur, chalk and green soap may be used. It should be applied freely at night and in the morning over all of the affected areas. The strength of this mixture can be doubled in obstinate cases. Balsam of Peru can be painted over portions of the body at night, followed by a bath in the morning. In rare instances, however, balsam of Peru produces violent dermatitis.

Balsamum Tolutanum (Bals. Tolu.), Balsam of Tolu, U. S. P. (Tolu Balsam).—A balsam obtained from *Toluifera Balsamum.*

PROPERTIES: Balsam of Tolu occurs as a yellowish-brown or brown plastic solid, becoming brittle when old, dried or exposed to cold. It is very soluble in alcohol, but nearly insoluble in water.

ACTION AND USES: Balsam of Tolu, like balsam of Peru, is expectorant and stimulant; it is not used externally at the present time. The use of balsam of Tolu in medicine is largely restricted. It is used as one of the ingredients of compound tincture of benzoin and as a flavor or pleasant vehicle in the form of:

SYRUPUS TOLUTANUS (SYR. TOLU.), SYRUP OF TOLU, U. S. P.—A solution of the aromatic constituents of balsam of Tolu in syrup.

ACTION AND USES: Syrup of Tolu is much used as a vehicle for expectorant mixtures.

DOSAGE: 15 Cc. or 4 fluidrams.

Belladonnae Folia (Bellad. Fol.), Belladonna Leaves, U. S. P. (Deadly Nightshade Leaves, Belladonnae Folium, P. I.).—The dried leaves of *Atropa Belladonna,* yielding, by the process outlined in the Pharmacopeia, not less than 0.3 per cent. of the total alkaloids from belladonna leaves.

ACTION AND USES: The active principles of belladonna act like atropin. Belladonna leaves are narcotic, anodyne, antispasmodic and mydriatic, the medicinal value being due to the contained mydriatic alkaloids.

TINCTURA BELLADONNAE FOLIORUM (TR. BELLAD. FOL.), TINCTURE OF BELLADONNA LEAVES, U. S. P.—One hundred Cc. represents about 10 Gm. of the drug.

INCOMPATIBILITIES: The tincture should not be prescribed with alkalies.

DOSAGE: 0.75 Cc. or 12 minims, representing approximately *0.2 mg. or* $\frac{1}{300}$ grain of mydriatic alkaloids.

EXTRACTUM BELLADONNAE FOLIORUM (EXT. BELLAD. FOL.), EXTRACT OF BELLADONNA LEAVES, U. S. P.—A hydro-alcoholic extract of belladonna leaves in either a pilular or a powdered form. One gram represents about 4 Gm. of belladonna leaves.

DOSAGE: 0.015 Gm. or ¼ grain, corresponding approximately to 0.2 mg. or $\frac{1}{300}$ grain of mydriatic alkaloids.

EMPLASTRUM BELLADONNAE (EMP. BELLAD.), BELLADONNA PLASTER, U. S. P.—An adhesive plaster representing approximately 30 per cent. of extract of belladonna.

ACTION AND USES: The application of extract of belladonna to the skin secures a local anodyne effect which is employed for the relief of rheumatic and neuralgic pains and soreness. It is a serviceable application in acute inflammatory conditions.

Plasters are not commonly made by pharmacists, but are supplied already spread by the manufacturers.

They are usually prescribed by the size according to the area of skin to be covered.

UNGUENTUM BELLADONNAE (UNG. BELLAD.), BELLADONNA OINTMENT, U. S. P.—An ointment containing 10 per cent. of extract of belladonna in a mixture of hydrous wool fat and benzoinated lard.

Benzoinum (Benzoin.), Benzoin, U. S. P.—A balsamic resin obtained from several species of *Styrax* trees growing in the East Indies. The drug is now official as Sumatra Benzoin and Siam Benzoin.

PROPERTIES: Benzoin contains benzoic acid (Siam benzoin), cinnamic acid (Sumatra benzoin) and resins which are soluble in alcohol and to some extent at least in oils and fats.

TINCTURA BENZOINAE COMPOSITA (TR. BENZ. CO.), COMPOUND TINCTURE OF BENZOIN, U. S. P.—A mixture of the alcohol-soluble constituents of benzoin, 10 Gm.; aloes, 2 Gm.; storax, 8 Gm., and balsam of Tolu, 4 Gm., in sufficient alcohol to make 100 Cc.

ACTION AND USES: Compound tincture of benzoin is used as an application to the inflamed mucous membrane of the throat and bronchi by inhalation. It is soothing and acts as a stimulating expectorant. It is frequently administered by adding a teaspoonful to a glassful of boiling water and inhaling the vapor. It is also used as an addition to lotions of glycerin and water. It is useful as a stimulant and protective for ulcers, bedsores, cracked nipples and fissures of the lips, anus, etc.

Benzosulphinidum (Benzosulphinid.), Benzosulphinid, U. S. P. (Saccharin, Glusidum).—The anhydrid, $C_6H_4SO_2.CONH$, of ortho-sulphamid-benzoic acid (Benzosulphonic-imid).

PROPERTIES: Benzosulphinimid is a white, crystalline powder, nearly odorless, *having* an intensely sweet taste even in dilute solutions. It *is soluble in alcohol* (1: 31), but only slightly soluble in water (1: 290).

The addition of an alkali materially increases the solubility of saccharin in water by formation of a salt, and it is often prescribed mixed with an equal quantity of sodium bicarbonate or in the form of a sodium salt known as "soluble saccharin." Saccharin is about 500 times as sweet as sugar, but has a slightly different taste which is generally objected to after continued use.

ACTION AND USES: Saccharin in small amounts has no pronounced pharmacologic effect. The saccharin administered is excreted almost unchanged in the urine.

It is used as a substitute for sugar in the food of diabetics. It must be remembered that saccharin has no food value. Some observers believe it to be always harmful.

DOSAGE: 0.2 Gm. or 3 grains. It may be mixed with an equal weight of sodium bicarbonate to insure its solubility. A ½-grain tablet is the most useful.

Betanaphthol (Betanaph.), Betanaphthol, U. S. P. (Naphthol).—A monohydroxyphenol ($C_{10}H_7OH$) of the naphthalene series.

PROPERTIES: It occurs as colorless, or pale buff-colored, crystalline laminae or a crystalline powder, having a faint phenol-like odor and a pungent taste. It is only very slightly soluble in water (1: 1000), but is very soluble in alcohol (1: 0.8).

ACTION AND USES: Betanaphthol is irritating to the skin or mucous membranes when applied in solution. If absorbed in considerable amount it may cause nephritis. It tends to destroy the red blood-corpuscles and has been known to produce changes in the retina and opacity of the lens. It is a powerful antiseptic, several times stronger than phenol.

Betanaphthol is applied externally as a parasiticide and antiseptic. Internally it has been much used as an intestinal antiseptic, but its utility is limited because of the danger of poisonous consequences from its possible absorption. It has also been used as an anthelmintic for the treatment of hookworm disease.

DOSAGE: 0.1 to 0.3 Gm. or 1½ to 5 grains. It is best given in powder or capsules. Externally it may be used in the form of ointment.

Bismuthi Subcarbonas (Bism. Subcarb.), Bismuth Subcarbonate, U. S. P.—A basic carbonate of bismuth of varying chemical composition, some specimens being more basic than others.

PROPERTIES: Bismuth subcarbonate is practically insoluble in water or alcohol. It is decomposed by hydrochloric or nitric acid, giving a copious effervescence of carbon dioxid and producing a chlorid or nitrate of bismuth which enters into solution. When such a solution is diluted with water the insoluble basic chlorid (oxychlorid or subchlorid) or basic nitrate of bismuth is precipitated. Bismuth subcarbonate is readily decomposed by the acid of the gastric juice, but in this case while the acid is neutralized, an insoluble oxychlorid of bismuth remains, coating the stomach and thus acting therapeutically in the same manner as the original subcarbonate would.

INCOMPATIBILITIES: It is incompatible with sulphids, *sulphur, acids and* acid salts.

ACTION AND USES: Bismuth subcarbonate acts like other insoluble salts of bismuth. For its uses see **Bismuthi Subnitras.** In roentgenography it is to be preferred to bismuth subnitrate because of the fact that it cannot give rise to nitrite poisoning, which has occasionally happened when large doses of the subnitrate were used.

DOSAGE: 0.5 Gm. or 8 grains.

Bismuthi Subgallas (Bism. Subgall.), Bismuth Subgallate, U. S. P. (Dermatol).—A basic gallate of bismuth of varying chemical composition, containing bismuth equivalent to from 52 to 57 per cent. of bismuth oxid.

PROPERTIES: Bismuth subgallate occurs as an amorphous, bright yellow powder without odor or taste. It is practically insoluble in water and in alcohol, but is decomposed by hydrochloric, nitric or sulphuric acid if heated. It is also decomposed by alkali hydroxids.

INCOMPATIBILITIES: Bismuth subgallate is incompatible with acids, alkalies, sulphids and sulphur.

ACTION AND USES: Bismuth subgallate was introduced under the name of "Dermatol" for the treatment of skin diseases. Its action and uses are similar to those of Bismuth Subnitrate, which see.

DOSAGE: 0.25 Gm. or 4 grains.

Bismuthi Subnitras (Bism. Subnit.), Bismuth Subnitrate, U. S. P.—A basic bismuth nitrate of varying chemical composition.

PROPERTIES: Bismuth subnitrate occurs as a heavy, white odorless and almost tasteless powder. It is practically insoluble in water and in alcohol. Hydrochloric acid of the usual strength of the gastric juice decomposes only a small amount in the course of several hours. Hydrochloric or nitric acid, if not too dilute, decomposes bismuth subnitrate, producing the chlorid or nitrate, which enters into solution; but when this solution is diluted with water the insoluble basic chlorid (oxychlorid or subchlorid) or basic nitrate (subnitrate) is precipitated.

INCOMPATIBILITIES: Bismuth subnitrate is incompatible with acids, tannins, sulphids and sulphur. With soluble carbonates and bicarbonates in the presence of water there is a liberation of carbon dioxid, a formation of insoluble bismuth compound, and the nitrate of the alkali metal. With iodids a double decomposition has been noted with the formation of the red basic iodid of bismuth and the nitrate of the metal whose iodid was used.

ACTION AND USES: Soluble bismuth compounds, as a rule, become converted in the presence of water into insoluble basic compounds. Most of the preparations used in medicine are already in the basic form. (As the action of bismuth preparations depends on the action of an insoluble powder, there is no object in prescribing a soluble salt.) The salt most frequently used is bismuth subnitrate; but since this sometimes produces poisonous effects, the subcarbonate is preferable. Under some circumstances the nitrate radical may be reduced to nitrite, especially by the

putrefactive bacteria of the large intestine. All the insoluble compounds of bismuth used in medicine produce essentially the same effects. They are best administered in the form of powders, capsules or cachets.

Bismuth subnitrate is not appreciably affected by the gastric juice and does not materially lessen its acidity. When given in considerable doses it coats the mucous membrane and acts as a mechanical protective. It thus prevents the action of the digestive secretions and of irritating foods or other substances on the mucous membrane. The same is true of its effect on the mucous membrane of the intestine. It is not absorbed in the stomach. It undergoes chemical changes in the intestine and is probably absorbed there to some extent though seldom in sufficient quantities to produce symptoms of poisoning. It is excreted almost entirely by the cecum and other parts of the large intestine. It is turned black in the large intestine, probably from contact with sulphids. When applied to the skin it acts mechanically, but on wounds and ulcers, as on mucous membranes, it acts as a protective, astringent and antiseptic. It is absorbed from wounds to a larger extent than from mucous membranes. A number of cases of poisoning have been so caused.

Bismuth subnitrate and other insoluble salts of bismuth are used in irritation of the stomach and intestines for their protective and astringent powers. They are useful to allay vomiting from gastric irritation. In the same manner they serve to check diarrhea. They are useful in hyperacidity and ulcer of the stomach by coating and protecting the mucous membrane. They are also employed in catarrh of the stomach and intestines. They may be given for the same purpose in ulcerative enteritis. Externally the subnitrate and subcarbonate are used as protective and antiseptic applications in skin diseases and as applications to ulcers or suppurating wounds and to promote the healing of old sinuses and fistulous tracts. In the latter case the bismuth is used in the form of a paste, combined with petrolatum and wax. A number of cases of poisoning have been reported due to the absorption of the bismuth; hence care must be exercised in its use and on the appearance of toxic symptoms, such as a blue line on the gums, headache, nausea and stomatitis, the bismuth should be removed from the fistula by the injection of warm olive oil.

DOSAGE: 1 Gm. or 15 grains. For the treatment of ulcer much larger doses are used. Externally it is used freely as a dusting powder or in ointment. Very large quantities are used for the purpose of outlining the stomach and intestines by roentgenography and by the fluoroscope, but the occasional occurrence of nitrite poisoning has led to a preference for the subcarbonate or subchlorid or pure barium sulphate for Roentgen-ray work. Poisoning by *nitrites is indicated* by vasomotor paralysis, tachycardia *and asphyxia due* to the formation of methemoglobin.

Bismuthi Subsalicylas (Bism. Subsalicyl.), Bismuth Subsalicylate, U. S. P.—A basic bismuth salicylate of varying chemical composition.

PROPERTIES: Bismuth subsalicylate occurs as a white or nearly white amorphous crystalline powder, odorless and tasteless. It is practically insoluble in cold water; on prolonged boiling with water a portion of the salicylic acid passes into solution with the formation of a more basic bismuth salicylate.

INCOMPATIBILITIES: It is decomposed by hydrochloric acid or nitric acid, a more basic insoluble compound remaining. Alcohol also decomposes bismuth subsalicylate with accompanying solution of the liberated salicylic acid. The compound is also incompatible with alkali carbonates and bicarbonates, tannin and salts of iron.

ACTION AND USES: Bismuth subsalicylate, like other salts of bismuth, is protective and astringent; it has also been recommended to some extent as an intestinal antiseptic. Because of the readiness with which it is decomposed it is best prescribed in the form of powders, capsules or cachets.

DOSAGE: 0.25 Gm. or 4 grains.

CACHETAE, CACHETS.—Cachets, or wafers, are made by pressing a mixture of flour, or starch and water between hot iron plates, and are used much in the same way as capsules for enclosing dry and powdered drugs, but are usually of much greater capacity. They have the advantage over capsules of being more readily dissolved and despite their comparatively large size are easily swallowed if previously dipped into water or if floated on a tablespoonful of water.

Caffeina (Caffein.), Caffein, U. S. P.—A feebly basic substance obtained from the leaves of *Thea sinensis* or from the seeds of *Coffea arabica* and also found in other plants. Tea contains from 1 to 4 per cent. of caffein; coffee from 1 to 2 per cent.

PROPERTIES: Caffein is trimethyl-xanthin, $C_6H(CH_3)_3N_4O_2$. It occurs as white silky, glistening needles, usually matted together in fleecy masses, odorless and having a bitter taste. It is soluble in water (1: 46) and in alcohol (1: 66). The solubility in water is materially increased by the addition of sodium benzoate or sodium salicylate.

ACTION AND USES: Small doses of caffein act on the nervous system, stimulating the psychic centers, the respiratory and vasomotor centers and the reflexes. It modifies the circulation by stimulating the heart, and relaxing the vessels by direct action. The flow of urine is increased. Muscular contraction is facilitated and fatigue lessened. Excessive doses produce insomnia, nervousness, headache, palpitation and nausea or vomiting, especially in susceptible persons. They lessen the capacity for mental or muscular work. Toxic doses may produce tetanic convulsions and cardiac dilatation.

ACTION ON THE CIRCULATION: Caffein has a rather complex and, therefore, somewhat inconstant action. In thera-

peutic doses the pulse may be quickened or slowed. The blood-vessels tend to dilate by the peripheral action and to contract by the central action. The dilatation probably predominates in the kidney in most cases, but the blood-pressure rises slightly by increased force and output of the heart. This increased output and lessened resistance tend to produce a more rapid flow of blood, and this results in an increased flow of urine. These effects make caffein especially efficient in some cases of cardiac dropsy, although it is generally inferior to digitalis. The cardiac stimulation is also useful in temporary cardiac weakness.

By the Germans, and by many physicians in this country, caffein is looked on as the most valuable drug for the treatment of circulatory failure in acute infectious processes, such as pneumonia, peritonitis, scarlet fever, etc.

A disadvantage in the use of large doses is the cerebral stimulation produced, which often prevents sleep. Some authors do not approve of the use of caffein as a cardiac remedy, but believe that its utilities are confined to its diuretic action.

Caffein is used as a nervous stimulant in cases of nerve exhaustion. It is useful in collapse by causing rise of blood-pressure and stimulating the respiration. It may be used in narcotic poisoning in the form of hot coffee, or by itself, for its effect on the respiratory system. It is especially useful in opium poisoning, and it may be used in alcoholic poisoning on the same principle. It relieves some forms of headache, but in the congestive form it may increase the difficulty. It is excreted by the kidney partly under its own form, partly as mono- or dimethyl-xanthin. It does not increase the amount of uric acid in the urine.

DOSAGE: The dose of caffein varies from 0.06 Gm. to 0.3 Gm., or about 1 to 5 grains. A cup of the beverage made from a tablespoonful (15 Gm.) of ground coffee would contain from 0.1 to 0.2 Gm. or from 1½ to 3 grains of caffein.

The alkaloid may be given in the form of powder or in capsules or cachets. In combination with equal parts of sodium benzoate or sodium salicylate it dissolves readily, and may be given hypodermically or administered by mouth.

CAFFEINA CITRATA (CAFFEIN. CIT.), CITRATED CAFFEIN, U. S. P.—A mixture of equal parts of caffein and citric acid.

PROPERTIES: Citrated caffein is a white odorless powder having a slightly bitter taste and an acid reaction. It is more readily soluble than the alkaloid, but is not adapted for hypodermic use.

DOSAGE: 0.1 to 0.3 Gm. or about 2 to 5 grains.

Caffeinae Sodio-Benzoas (Caff. Sod. Benz.), Caffein Sodio-*Benzoate, U. S. P.*—A mixture of equal parts of caffein *and sodium benzoate.*

PROPERTIES: It is freely soluble (1: 1) in water and soluble in alcohol (1: 30). It is well adapted for administration in solution either by mouth or hypodermically.

DOSAGE: 0.10 Gm. or about 1½ grains.

Calcii Carbonas Praecipitatus (Calc. Carb. Praec.), Precipitated Calcium Carbonate, U. S. P. (Precipitated Chalk).—Calcium carbonate, $CaCO_3$, obtained by precipitating a solution of a salt of calcium by a soluble carbonate, collecting and washing the precipitate and drying.

PROPERTIES: Precipitated calcium carbonate is a fine white powder without odor or taste. It is practically insoluble in water, but dissolves to a considerable extent in water containing carbon dioxid. It is decomposed by acids, forming a salt of calcium and giving off carbon dioxid with effervescence.

ACTION AND USES: Calcium carbonate neutralizes the acid of the gastric juice, calcium chlorid being formed and absorbed to some extent. If the stomach contains no acid it may escape solution and absorption. When absorbed the action is that of the soluble salts of calcium, which will be described under Calcium Chlorid.

Calcium carbonate is used chiefly as an antacid. For this purpose it is used as the base of many tooth-powders. It is given in the form of powder as an antacid in acid gastritis, hyperchlorhydria and gastric ulcer. In prescribing it for such affections its power to check diarrhea and the astringent power with which it is credited should be borne in mind. It is especially appropriate to cases in which there is hyperacidity with accompanying diarrhea and in diarrhea with acid fermentation. It may be used in skin-diseases as a dusting-powder to neutralize acid secretions and to protect the skin.

Calcium carbonate is the appropriate antidote to oxalic acid as it neutralizes the acid with the formation of the insoluble oxalate of calcium. It is also a suitable antidote to other corrosive acids and has the advantage that an excess can be given without doing harm.

DOSAGE: From 1 to 3 Gm. or from 15 to 45 grains. The fine powder can be given to adults in teaspoonful doses as no harm is to be feared from moderate excess. One gram will neutralize 0.730 Gm. of absolute HCl, or approximately the amount of free HCl in 500 c.c., or 1 pint of stomach contents having 40 degrees of free acidity.

Calcii Chloridum (Calc. Chlor.), Calcium Chlorid, U. S. P.—A hydrated form of calcium chlorid containing not less than 75 per cent. of $CaCl_2$.

PROPERTIES: Calcium chlorid occurs as white, translucent fragments, which are odorless and have a sharp saline taste. It is very deliquescent and should be kept in well-stoppered bottles. It is freely soluble in water (1: 1.2) and also in alcohol (1: 10).

INCOMPATIBILITIES: Soluble carbonates, phosphates and sulphates produce a precipitate of the corresponding insoluble salts of calcium.

ACTION AND USES: The chlorid is more irritating to the stomach than other salts of calcium and it should always be given well diluted. It is absorbed slowly and imperfectly; in the intestine it may be converted into the insoluble carbonate or phosphate, and the greater part of the calcium is excreted in this form. Calcium salts are sedatives to muscle and nerve action when absorbed. A lack of calcium in the tissues is believed to be a factor in the development of nervous irritability, tetany and other forms of convulsions. These effects, however, are not produced when calcium is given by the mouth. There is no lack of calcium in the system under ordinary diet. It is therefore doubtful whether calcium chlorid has much if any systemic action when administered by mouth. It is used, however, in hemophilia, typhoid fever and other hemorrhagic conditions, with the idea of increasing the coagulability of the blood. Direct observations of the coagulation time have given contradictory, but generally negative results. The clinical evidence is not very strong, but the drug is at least harmless. Calcium chlorid is also administered, apparently with benefit, against urticaria and serum rashes.

When injected directly into the blood, calcium salts depress the nervous and muscular systems, while the inactivation of calcium by the injection of oxalates and citrates produces convulsions. This is the basis of an as yet unproved hypothesis that certain forms of nervous irritability are due to disturbed calcium metabolism.

DOSAGE: 0.5 Gm. or 8 grains. Calcium chlorid is best administered in dilute solution sweetened with syrup or elixir.

Calcii Lactas (Calc. Lact.), Calcium Lactate, U. S. P.—The hydrated form of calcium lactate. Contains when dried to constant weight not less than 98 per cent. of $Ca(C_3H_5O_3)_2$.

PROPERTIES: Calcium lactate occurs in white crystalline masses or powder, odorless and nearly tasteless. It is soluble in water (1:20), but very slightly soluble in alcohol.

INCOMPATIBILITIES: Calcium lactate is incompatible with carbonates, sulphates and other compounds forming insoluble calcium salts.

ACTION AND USES: Calcium lactate has the pharmacologic action of other soluble calcium salts (see **Calcium Chlorid**) but is less irritating than the chlorid and, therefore, especially suitable for hypodermic use.

DOSAGE: 0.5 Gm. or 8 grains.

Calx, Calcium Oxid, U. S. P. (Lime, Quicklime).—Contains when freshly ignited not less than 95 per cent. of CaO.

PROPERTIES: Calcium oxid occurs as hard, white or grayish-white es, which, in contact with the air, gradually attract moisture and n dioxid and fall to a white powder; it is odorless and has a

caustic taste. Calcium oxid is converted into calcium hydroxid on the addition of water, and this is slightly soluble in cold water (1: 840), less soluble in hot water and practically insoluble in alcohol.

Milk of lime is calcium hydroxid mixed with water in the proportion of 1 part of lime to 4 of water.

ACTION AND USES: Lime as calcium hydroxid is a fairly active germicide. It will neutralize acids, forming soluble salts of calcium.

On account of its cheapness lime is much used as a disinfectant. In the form of milk of lime or whitewash, it is a serviceable application to privies or to the walls of infected rooms. It is especially useful for the disinfection of excreta. Freshly prepared milk of lime should be added in volume equal to that of the material to be disinfected, the mass thoroughly mixed and allowed to stand for two hours before disposal.

LIQUOR CALCIS (LIQ. CALC.), SOLUTION OF CALCIUM HYDROXID, U. S. P. (Lime-water).—A saturated solution of calcium hydroxid containing about 0.14 per cent. of $Ca(OH)_2$.

PROPERTIES: Lime-water is a clear, colorless liquid without odor, and has an alkaline, bitter taste. Lime-water absorbs carbon dioxid from the air, readily forming the insoluble calcium carbonate, and leaving the solution weaker in consequence. The Pharmacopeia gives a convenient method of assay, and there is no excuse for the pharmacist who dispenses an inferior preparation. The strength of lime-water should be preserved by keeping an excess of lime in the bottom of the container. When the lime-water is to be used the clear supernatant liquid should be decanted.

INCOMPATIBILITIES: Lime-water iis incompatible with acids and with carbonated, or ordinary hard water.

ACTION AND USES: Lime-water is antacid and astringent and is often used as an addition to milk for both adults and children. The usual proportion is 1 of lime-water to 4 of milk, but a mixture of equal parts may be given. This is administered in small doses to allay nausea and vomiting. It is also used for diarrhea. Lime-water is used externally in the treatment of burns.

DOSAGE: 15 Cc. or about 4 fluidrams, containing approximately 0.02 Gm. or ⅓ grain of calcium hydroxid.

LINIMENTUM CALCIS (LIN. CALC.), LIME LINIMENT, U. S. P.—This is more popularly known as Carron oil from the name of the iron works, in England, where it originated.

PROPERTIES: It is essentially a mixture of equal parts of a bland fixed oil and lime-water of official strength. The Pharmacopeia at present directs the use of linseed oil, but this has no advantages over some of the more limpid, and less odorous fixed oils, and by some is thought to be less desirable.

ACTION AND USES: Lime liniment is applied to burns by spreading it on cloths and applying to the surface. It should be renewed frequently in order to prevent the dressing from adhering.

Calx Chlorinata (Calx Chlorin.), Chlorinated Lime, U. S. P. (Chlorinated Calcium Oxid, Bleaching Powder "Chlorid of Lime").—Bleaching powder, often improperly called chlorid of lime, is a variable compound resulting from the action of chlorin on calcium hydroxid. It should contain not less than 30 per cent. of available chlorin, that is, chlorin which is set free by the action of an acid.

PROPERTIES: Chlorinated lime occurs as a white or grayish-white granular powder, having a chlorin-like odor, and a repulsive saline taste. It is only partially soluble in water or alcohol.

ACTION AND USES: Chlorinated lime is a disinfectant. A 5 per cent. solution is a convenient strength for ordinary use. It is being used quite extensively as the source of chlorin for treating contaminated drinking-waters. A fresh solution of about 0.5 per cent. strength should be added to the water to be treated, in the proportion of about 250 gallons per million gallons of water, the proportion varying with different waters.

Hypochlorites in acid, alkaline and neutral solutions have been found useful in the treatment of infected wounds. The acid solution (Lorrain Smith's) may be prepared by shaking 12.5 Gm. of chlorinated lime and 12.5 Gm. powdered boric acid with 1 liter of water, allowing the mixture to stand for some hours, and filtering. The neutral solution (Neutral Solution of Chlorinated Soda, N. N. R.) of Carrel and Dakin contains 0.43 to 0.48 per cent. of available chlorine, free from caustic alkali. It is prepared by decomposing chlorinated lime with specified amounts of sodium carbonate and sodium bicarbonate in the presence of water. After the precipitate formed has subsided, the supernatant solution is filtered off and adjusted to the required content of available chlorine. The alkaline preparation of hypochlorites (Solution of Chlorinated Soda, U. S. P.) is described below. Unless strongly alkaline, solutions of hypochlorites decompose rapidly.

LIQUOR SODAE CHLORINATAE (LIQ. SOD. CHLORINAT.), SOLUTION OF CHLORINATED SODA, U. S. P. (Labarraque's Solution).—An aqueous solution of sodium hypochlorite and sodium chlorid containing at least 2.5 per cent. of available chlorin. It is made by decomposing a solution of chlorinated lime with sodium carbonate and removing the insoluble calcium carbonate formed.

ACTION AND USES: Solution of chlorinated soda, like chlorinated lime, is used chiefly as a disinfectant and antiseptic. Diluted with from 15 to 20 parts of water it may be used as a spray, gargle or wash.

DOSAGE: 1 Cc. or 15 minims.

Camphora (Camph.), Camphor, U. S. P.—A ketone, $C_8H_{14}CO$, obtained from *Cinnamomum Camphora*. It is dextrogyrate.

PERTIES: Camphor occurs as white translucent masses of a *consistence and* having a characteristic odor and a pungent,

aromatic taste. It is readily pulverizable in the presence of a little alcohol, ether or chloroform. It is very slightly soluble in water, but freely soluble in alcohol, ether, chloroform and in fixed and volatile oils.

ACTION AND USES: Camphor stimulates the central nervous system, especially the medullary centers, and the circulation; locally it is mildly irritant and antiseptic. In toxic doses it produces delirium followed by unconsciousness with epileptiform convulsions. It has been used as a nerve depressant in epilepsy and convulsions, but owing to its stimulating action this use seems irrational.

Camphor tends to increase the blood-pressure. The effects on animals are complex and rather inconstant, but many clinicians believe that camphor improves the pulse in impending cardiac collapse, probably by cardiac stimulation. For this reason it is used as a circulatory and respiratory stimulant in cases of collapse, syncope, cardiac failure, etc. It should be administered hypodermically, 0.5 c.c. of a 10 per cent. sterile solution in olive oil being injected every fifteen minutes for four doses if needed.

The antiseptic action of camphor is utilized in gargles and mouth washes. It is also given in dyspepsia as a carminative, and is used in the first stage of colds and other infections of the respiratory tract.

Locally camphor causes a loss of tone of the peripheral blood-vessels, and thus produces redness of the skin. It has also a local anesthetic action. It is employed, for its mild rubefacient and counterirritant effects, as an ingredient of liniments.

DOSAGE: 0.10 Gm. or about 1½ grains.

The average dose of camphor is commonly given as 2 grains, but when a prompt cardiac or central action is demanded, much larger doses may be required. It may be given in an oily or alcoholic solution or in pills, capsules or cachets.

AQUA CAMPHORAE (AQ. CAMPH.), CAMPHOR WATER, U. S. P.—A saturated solution of camphor in distilled water. It is a very weak preparation. Camphor water is often used as a vehicle for collyria.

DOSAGE: 10 Cc. or about 2½ fluidrams (containing 0.04 Gm. or ½ grain of camphor).

SPIRITUS CAMPHORAE (SP. CAMPH.), SPIRIT OF CAMPHOR, U. S. P.—One hundred Cc. contain 10 Gm. camphor in alcohol.

DOSAGE: 1 Cc. or 15 minims.

LINIMENTUM CAMPHORAE (LIN. CAMPH.), CAMPHOR LINIMENT, U. S. P. (Camphorated Oil).—One hundred Cc. contain 20 Gm. camphor in cottonseed oil. A more limpid oil may be preferred, particularly if the preparation is to be used for hypodermic injection.

Cantharis (Canthar.), Cantharides, U. S. P. (Spanish Flies, Russian Flies).—The beetle *Cantharis vesicatoria,* yielding not less than 0.6 per cent. of cantharidin.

ACTION AND USES: Cantharides is very irritating to the intestinal canal, producing hyperemia of the mouth and throat and vomiting. It is readily absorbed from the intestinal canal and produces marked irritation of the kidneys. The nephritis affects, at first, the glomeruli and subsequently the urinary tubules. In its passage through the urinary channels, it irritates the mucous membranes of the bladder and urethra and produces a desire to urinate, sometimes amounting to strangury. Cantharides is also a local irritant to the skin and produces blisters. It may be absorbed from the skin in sufficient quantities to cause nephritis. The internal use of cantharides is not advisable, although it has been employed in the treatment of chronic nephritis and incontinence of urine. Only minute doses should ever be given for these affections, and as soon as any evidence of vesical irritation arises the remedy should be suspended.

The local irritant action of cantharides is the basis of its use for the treatment of baldness, but it is of little benefit in that condition. It is used for baldness in the form of tincture greatly diluted with alcohol (from 1:15 to 1:30) or in ointments. The chief use of cantharides is as a vesicant. It is contra-indicated in nephritis, and when vesication is desired in nephritis, another agent such as ammonia or chloroform should be selected. It may be used to produce redness and counterirritation in quantities not sufficient to blister. When the irritation is carried just to the point of beginning vesication, the result is known as a flying blister. The counterirritation may be rendered continuous by a succession of such "flying" blisters.

CERATUM CANTHARIDIS (CERAT. CANTHAR.), CANTHARIDES CERATE, U. S. P. (Blistering Cerate).—Contains 35 per cent. of cantharides.

Ceratum cantharidis may be used for the purpose of vesication, but the blistering plasters commonly put up by manufacturers have a slightly different base. When cantharides is applied for the purpose of vesication a blister will usually be formed in the course of six hours. Vesication can sometimes be hastened by removing the cantharides plaster after a few hours and applying hot poultices. Blisters should not be applied directly over an inflamed part.

TINCTURA CANTHARIDIS (TR. CANTHAR.), TINCTURE OF CANTHARIDES, U. S. P. (Cantharidis Tinctura, P. I.).—One hundred Cc. represents 10 Gm. of cantharides in *alcohol.*

DOSAGE: 0.1 Cc. or 1½ minims.

The following application has been suggested for baldness:

℞	Tr. canthrid.	8	ʒij
	Tr. capsici	1	ɱxv
	Alcoholis	45	ʒjss
	Aq. ros.	ad 150	ʒv

M.

Capsicum (Capsic.), Capsicum, U. S. P. (Cayenne Pepper, African Chillies).—The dried, ripe fruit of *Capsicum frutescens.*

ACTION AND USES: Capsicum is carminative, stimulant and rubefacient. It is frequently prescribed in atonic dyspepsia, especially in cases due to chronic alcoholism. Such use should be cautious and not long continued.

DOSAGE: 0.06 Gm. or about 1 grain. Externally it is frequently used in the form of liniment, preferably a simple mixture of the tincture (25 per cent.) with the official soap liniment. The tincture mixed with an equal quantity of glycerin is used as a gargle in tonsillitis, pharyngitis, etc. Capsicum plaster is a suitable preparation for the relief of neuralgia, muscular rheumatism, etc.

TINCTURA CAPSICI (TR. CAPSIC.), TINCTURE OF CAPSICUM, U. S. P.—One hundred Cc. represent 10 Gm. of the drug in approximately 90 per cent. alcohol.

DOSAGE: 0.5 Cc. or 8 minims.

CAPSULAE, CAPSULES.—Capsules, either hard or soft, are made of gelatin molded over a suitable form. Hard capsules, made in different sizes, have long been used for administering liquids as well as solids, while soft capsules, containing an admixture of glycerin to the gelatin, are used extensively for oils and oleoresins or solutions of active drugs in oils.

Carbo Ligni (Carbo Lig.), Wood Charcoal, U. S. P. (Charcoal).—Prepared from soft wood (either willow or maple) and very finely powdered.

PROPERTIES: Charcoal is a black, odorless and tasteless powder, free from gritty matter.

ACTION AND USES: Locally charcoal is employed as a deodorant for fetid ulcers, etc., usually as a poultice.

Because of its well-known property of absorbing and condensing gases, charcoal has long been administered in various forms of gastric disturbance, the prescribers evidently losing sight of the fact that when thoroughly wet it almost entirely loses its property of absorbing gases. It is used to indicate the length of time food remains in the alimentary tract. Charcoal administered with the test diet causes the feces formed from that diet to have a black color. It is also commonly used to distinguish the periods of diet in metabolism experiments.

DOSAGE: 1 Gm. or 15 grains. Preferably administered in *cachets* or capsules.

Cardamomi Semen (Cardam. Sem.), Cardamom Seed, U. S. P. (Cardamomum, U. S. P. VIII).—The dried seeds of *Elettaria Cardamomum.*

ACTION AND USES: Cardamom is used as an aromatic, carminative and stomachic.

TINCTURA CARDAMOMI (TR. CARDAM.), TINCTURE OF CARDAMOM.—Represents 20 per cent. of cardamom in diluted alcohol. This preparation should not be confounded with compound tincture of cardamom, which is a comparatively weak solution of the soluble constituents of cardamom, cinnamon and caraway in diluted alcohol, colored red with cochineal.

DOSAGE: 5 Cc. or 1 fluidram.

Caryophyllus (Caryoph.), Clove, U. S. P. (Cloves).—The dried flower buds of *Eugenia aromatica.*

OLEUM CARYOPHYLLI (OL. CARYOPH.), OIL OF CLOVE, U. S. P. (Clove Oil, Oil of Cloves).—A volatile oil distilled from cloves, consisting largely (82 per cent.) of eugenol.

PROPERTIES: Oil of clove occurs as a colorless or pale yellow liquid, becoming darker and thicker by age and exposure. Oil of clove is freely soluble in alcohol, but nearly insoluble in water.

ACTION AND USES: Oil of clove is antiseptic and aromatic. It is frequently used as a carminative and externally as counterirritant. In dental practice it has long been used as an anodyne.

DOSAGE: 0.2 Cc. or 3 minims on granulated sugar or in some emulsion, on shaved ice or in capsules. To relieve toothache it should be dropped on a small piece of cotton and inserted into the cavity of the carious tooth. For external use it is usually diluted with 2 or 3 parts of fatty oil.

Cascara Sagrada (Casc. Sagr.), Cascara Sagrada, U. S. P. (Rhamnus Purshiana, U. S. P. VIII).—The dried bark of the trunk and branches of *Rhamnus purshiana.*

ACTION AND USES: The preparations of cascara sagrada are laxative, acting mainly in the colon, and are widely used for habitual constipation. The dose can be gradually reduced without constipation following.

FLUIDEXTRACTUM CASCARAE SAGRADAE (FLDEXT. CASCAR. SAGR.), FLUIDEXTRACT OF CASCARA SAGRADA, U. S. P. (Fluidextractum Rhamni Purshianae, U. S. P. VIII, Fluid Extract of Cascara Sagrada).—One hundred Cc. represent 100 Gm. of the drug in approximately 40 per cent. alcohol. The presence of a bitter principle renders this preparation useful as a stomachic as well as a laxative.

DOSAGE: 1 Cc. or 15 minims, 3 times daily; smaller doses should be used if efficient for laxative effect.

FLUIDEXTRACTUM CASCARAE SAGRADAE AROMATICUM (FLDEXT. CASCAR. SAGR. AROM.), AROMATIC FLUIDEXTRACT OF CASCARA SAGRADA, U. S. P. (Fluidextractum Rhamni Purshianae Aromaticum, U. S. P. VIII, Aromatic Fluidextract of Cascara Sagrada).—One hundred Cc. represent 100 Gm. of the drug previously treated with magnesium oxid, to deprive it of its bitter principle, and aromatized and sweetened with extract of glycyrrhiza, benzosulphinid, oil of anise, oil of cassia, oil of coriander and methyl salicylate. This preparation is preferred as a laxative on account of its pleasant taste.

DOSAGE: From 0.6 to 2 Cc. or from 10 to 30 minims. The smaller dose may be given several times a day, the larger once daily at bedtime.

EXTRACTUM CASCARAE SAGRADAE (EXT. CASC. SAGR.), EXTRACT OF CASCARA SAGRADA, U. S. P. (Extractum Rhamni Purshianae, U. S. P. VIII, Powdered Extract of Cascara Sagrada).—A powdered extract representing three times its weight of the drug.

DOSAGE: From 0.1 to 0.5 Gm. or from 2 to 8 grains.

CATAPLASMATA, POULTICES.—Poultices are soft solid preparations used for the purpose of applying heat and moisture to localized areas of the body. This application of heat induces a superficial hyperemia which is believed to influence the circulation of underlying parts. The poultices may also be made the means of applying counter-irritant drugs. A long-continued application tends to cause relaxation of the skin and to render it flabby.

Cera Alba (Cer. Alb.), White Wax, U. S. P., is the bleached form of:

Cera Flava (Cer. Flav.), Yellow Wax, U. S. P.—A solid substance prepared from the honeycomb of the bee, *Apis mellifera.* In medicine wax is chiefly used to stiffen ointments.

CERATA, CERATES—Cerates are solid ointment-like preparations containing sufficient wax to prevent them from melting at the temperature of the body.

For the preparation included in this list see:

CERATUM CANTHARIDIS, under **Cantharis.**

CHARTAE, PAPERS.—Medicated papers are pieces of absorbent paper that have been treated with medicinal substances or suitably sized paper coated with a layer of the medicinal substance.

Chenopodium.—Now used in medicine only as:

OLEUM CHENOPODII (OL. CHENOPOD.), OIL OF CHENOPODIUM, U. S. P.—A volatile oil distilled from Chenopodium

ambrosioides anthelminticum. It should be kept in well-stoppered amber-colored bottles, in a cool place, protected from light.

PROPERTIES: Oil of chenopodium is a colorless or pale yellow liquid, with a pungent, irritating odor and a bitter taste. It is soluble (1: 8) in 70 per cent. alcohol.

ACTION AND USES: Oil of chenopodium is used as an anthelmintic in ascarides and hookworm, the effect being due to the ascaridole present in the oil. The drug paralyzes but does not kill the parasites, which must be eliminated by free purgation. Oil of chenopodium is a marked circulatory and cardiac depressant, causing a fall of blood pressure and slowing of the heart, with a simultaneous decrease in the volume of the kidneys. Respiration may also be depressed. In animals small doses produce vomiting, somnolence and muscular incoordination; large doses, coma and paralysis. Convulsions have also been observed. Cases of poisoning in man, some of them fatal, have been reported. Fasting increases the toxicity of the drug. Subminimal doses, repeated at intervals of several days become toxic, thus indicating cumulation. The drug is absorbed slowly from the stomach, but rapidly from the intestine. Oil of chenopodium is also a local irritant.

DOSAGE: 0.2 Cc. or 3 minims. Larger doses, 0.5 to 1 Cc. (8 to 16 drops), have been given with sugar and followed by castor oil. If toxic symptoms, particularly inordinate sleepiness or depression manifest themselves, the drug should be withdrawn at once, active purgation induced and stimulation begun with strong hot coffee by mouth or rectum.

Chloralum Hydratum (Chloral. Hydrat.), Hydrated Chloral, U. S. P. ("Chloral," Chloral Hydrate).—A compound of trichloraldehyd or chloral, with the elements of one molecule of water. It contains not less than 99.5 per cent. of $CCl_3CH(OH)_2$.

PROPERTIES: Hydrated chloral occurs as colorless and transparent crystals, having an aromatic penetrating odor, and a bitterish, caustic taste. It is very soluble in water (1: 0.25) alcohol (1: 1.3) or ether.

INCOMPATIBILITIES: Hydrated chloral is incompatible with alkalies and alkali carbonates, which cause the formation of chloroform. From mixtures containing hydrated chloral, an alkali bromid and alcohol, a compound of chloral believed to be chloral alcoholate sometimes separates.

ACTION AND USES: Hydrated chloral acts on the central nervous system, small doses producing a feeling of weariness followed by quiet sleep in which the pulse and respiration are slowed in the same manner as in normal sleep and the reflexes are not abolished. From this sleep the person can readily be awakened. Larger doses produce *more rapid and deeper* unconsciousness and abolition of *reflexes. There is slowing* of the respiration and fall of

blood-pressure. The cutaneous vessels are dilated and a marked fall of temperature occurs. With fatal doses death occurs ordinarily by paralysis of the respiratory center but sometimes by paralysis of a weakened heart. Hydrated chloral is therefore to be used with special caution in cases of a weakened heart or blood-vessels.

Hydrated chloral is a very reliable hypnotic in insomnia due to nervous excitation. It is not so valuable when the sleeplessness is primarily due to a painful affection. In such cases morphin or codein is preferable. At times it may be combined with opium or morphin. It should not be used when there is a degeneration of the heart-muscle. In other cases of heart disease and in arteriosclerosis it may be given cautiously.

Hydrated chloral may be given in moderate doses as a nervous sedative, especially in conjunction with the bromids.

Hydrated chloral is also a valuable remedy to relax spasm. For this purpose it is often used in the first stage of labor to overcome rigidity of the os uteri. It is valuable in tetanus, in which it must be given boldly to overcome the convulsions. In delirium in fever it may be administered in small doses. It should not be given, however, if the delirium can be controlled by other means. It is useful as an antispasmodic in obstinate cases of hiccup. Hydrated chloral is antidotal to strychnin but is far inferior to ether for this purpose.

DOSAGE: From 0.30 to 1.30 Gm. or from 5 to 20 grains dissolved in water and given on cracked ice. The dose may be repeated in three hours, if needed, but the condition of the pulse and respiration should be carefully watched when large doses are given.

While hydrated chloral has the reputation of being especially dangerous, this refers to large doses. Smaller doses, 0.3 Gm. or 5 grains, are about as effective as the ordinary doses of other hypnotics and relatively safe. Habit formation is quite common, perhaps more so than with some other hypnotics.

Chloroformum (Chlorof.), Chloroform, U. S. P.—A liquid consisting of from 99 to 99.4 per cent. of chloroform, $CHCl_3$, and from 0.6 to 1 per cent. of alcohol, C_2H_5OH, added as a preservative.

Chloroform is now largely made by the decomposition of chloral by alkalies.

PROPERTIES: Chloroform occurs as a heavy clear, colorless and mobile liquid, of a characteristic odor, and a burning sweet taste. It is but slightly soluble in water (1:210), but is miscible, in all proportions, with alcohol, ether and the fixed and volatile oils.

INCOMPATIBILITIES: Chloroform should be protected from the light by storing in a dark place or in dark well-stoppered bottles. It readily deteriorates under the influence of heat, light and air, and the decomposition products

must be avoided in the use of this product in general anesthesia. For this reason the vapors should not be allowed to come in contact with a flame.

ACTION AND USES: Chloroform acts locally as a penetrating and fairly powerful irritant, which may blister if its evaporation is prevented. It is used in liniments. Taken by mouth, small doses are carminative, anodyne and antiseptic; it is therefore used in gastric fermentation and colic. Large doses are sometimes employed as a vermifuge, but are rather dangerous. Excessive doses produce unconsciousness and coma, similarly to the results of its inhalation.

Its main use is by inhalation, for the production of general anesthesia. The excitement stage resembles that of ether, but it is of shorter duration and therefore less unpleasant. It is much more dangerous, however, most acute fatalities occurring by stoppage of the heart early in the administration. This danger is lessened by atropin.

The anesthetic stage is also more dangerous than with ether, there being a gradual but progressive fall of blood-pressure, even if the administration is carefully managed. The fall is due to depression of both the cardiac muscle and vasomotor center. The respiratory center is also more depressed. If an excessive concentration is given, death occurs, in this stage usually by stoppage of respiration; but since the heart and vasomotor center are also greatly weakened, recovery is more difficult than with ether. Sometimes, especially in cardiac disease, the heart may be the first to fail.

The irritant actions on the kidneys and respiratory tract are probably about the same as with ether.

Prolonged administration is especially dangerous, often producing death after several days by so-called delayed chloroform poisoning. This is characterized by general fatty degeneration, especially marked in the liver, which may pass into a condition analogous to acute yellow atrophy.

Chloroform is distinctly less safe as an anesthetic than ether and should be employed only when ether is unavailable or its use inadmissible for some reason. Chloroform is held by many physicians as specially suitable for anesthesia in children and during childbirth.

It is frequently given to relieve pain in the stomach or bowels, especially pain of a colicky nature.

DOSAGE: From 0.05 to 0.3 Cc. or from 1 to 5 minims.

Chloroform may be prescribed in a variety of forms. *The Pharmacopeia* includes:

AQUA CHLOROFORMI (AQ. CHLOROF.), CHLOROFORM WATER, *U. S. P.—A saturated* aqueous solution of chloroform *containing approximately* 1 part in 200.

DOSAGE: It may be made extemporaneously by adding a few drops of chloroform to a glass of water, shaking well and allowing the excess to subside. A teaspoonful contains approximately 0.02 Cc. or ⅓ minim of chloroform. The average dose of chloroform water is 15 Cc. or 4 fluidrams.

SPIRITUS CHLOROFORMI (SP. CHLOROF.), SPIRIT OF CHLOROFORM, U. S. P.—One hundred Cc. contain 6 Cc. of chloroform in alcohol.

DOSAGE: 2 Cc. or 30 minims containing 0.12 Cc. or 2 minims of chloroform.

LINIMENTUM CHLOROFORMI (LIN. CHLOROF.), CHLOROFORM LINIMENT, U. S. P.—A 30 per cent. solution of chloroform in soap liniment.

Chromii Trioxidum (Chrom. Triox.), Chromium Trioxid, U. S. P. (Chromic Acid, Chromic Anhydrid).—Contains not less than 95 per cent. of CrO_3.

PROPERTIES: Chromium trioxid occurs as small needle-shaped crystals or prisms of dark purplish-red color and metallic luster; it is odorless, destructive to animal and vegetable tissue, deliquescent in air and very soluble in water (1: 0.6).

INCOMPATIBILITIES: Because of its powerful oxidizing properties chromium trioxid should not be brought in contact with alcohol, glycerin or other oxidizable substances lest explosion result.

ACTION AND USES: In medicine chromium trioxid is used only as a caustic either in the solid form or in aqueous solution. In nasal hemorrhage from ulcer of septum Holt recommends touching the ulcer with chromium trioxid.

Chrysarobinum (Chrysarob.), Chrysarobin, U. S. P.—A mixture of neutral principles extracted from Goa powder, a substance found deposited in the wood of *Vouacapoua Araroba.*

PROPERTIES: Chrysarobin is a pale orange-yellow to brownish, microcrystalline powder, tasteless, odorless and irritating to the mucous membrane. It is very slightly soluble in water (1: 385), but rather more soluble in alcohol and soluble in chloroform (1: 12.5).

ACTION AND USES: Chrysarobin is antiparasitic and a powerful irritant to the skin. It is a more active stimulant than tar and must be used with corresponding caution, except in dermatoses in which the production of an acute inflammatory reaction is sometimes desired. It is employed in the treatment of fungus diseases of the skin but is also of special use in chronic inflammatory dermatoses to produce a healthy reaction.

Chrysarobin is used externally in ointment or solution *in the strength* of from 2 to 10 or even 20 per cent. In *the weaker* proportions it is often quite as effective as in *the stronger* and does not excite acute dermatitis.

Chrysarobin stains the skin brownish, the hair greenish-yellow, the nails reddish-brown. Its use about the head should be avoided. It also stains clothing a walnut brown. This stain can be removed by dilute solution of caustic soda or solution of chlorinated soda.

UNGUENTUM CHRYSAROBINI (UNG. CHRYSAROBIN.), CHRYSAROBIN OINTMENT, U. S. P.—Representing a solution of about 5 per cent. of chrysarobin in benzoinated lard.

Cinchona (Cinch.), Cinchona, U. S. P.—Official as cinchona and cinchona rubra. The dried bark of several species, principally hybrids, of *Cinchona* yielding not less than 6 per cent. of the alkaloids of cinchona, the chief of which is quinin.

ACTION AND USES: The preparations of cinchona are seldom used to obtain the systemic effects of quinin. They are mostly employed as bitter tonics. (See **Quinin.**)

TINCTURA CINCHONAE (TR. CINCH.), TINCTURE OF CINCHONA, U. S. P.—One hundred Cc. represent about 20 Gm. cinchona in a mixture of alcohol (63 per cent.), water and glycerin.

DOSAGE: 4 Cc. or 1 fluidram.

TINCTURA CINCHONAE COMPOSITA (TR. CINCH. CO.), COMPOUND TINCTURE OF CINCHONA, U. S. P.—One hundred Cc. represent 10 Gm. red cinchona with bitter orange peel and serpentaria, as aromatics, in a mixture of alcohol (64 per cent.), water and glycerin.

DOSAGE: 4 Cc. or 1 fluidram.

Cinnamomum Saigonicum (Cinnam. Saigon.), Saigon Cinnamon, U. S. P.—The commercial drug is the dried bark or inner bark of an undetermined species of *Cinnamomum.*

ACTION AND USES: In medicine it is largely used as an aromatic or carminative.

OLEUM CASSIAE (OL. CASS.), OIL OF CINNAMON, U. S. P. (Oleum Cinnamomi, U. S. P. VIII, 'Cassia Oil.—A volatile oil distilled from *Cinnammomum Cassia,* yielding not less than 80 per cent. of cinnamic aldehyd. It occurs as a yellowish liquid having the characteristic odor of cinnamon and a sweetish, spicy and burning taste. It is freely soluble in alcohol but only very slightly soluble in water.

DOSAGE: 0.05 Cc. or 1 minim.

AQUA CINNAMOMI (AQ. CINNAM.), CINNAMON WATER, U. S. P.—A saturated solution of oil of cinnamon in distilled water; it is largely used as a vehicle.
DOSAGE: 15 Cc. or 4 fluidrams.

Cocaina (Cocain.), Cocain, U. S. P.—An alkaloid obtained from *Erythroxylon Coca.*

PROPERTIES: Cocain forms large colorless prisms, having a slightly bitter taste and producing on the tongue a temporary numbness. It is only slightly soluble in water (1: 600), soluble in alcohol (1: 6.5), and also soluble in fixed oils, but insoluble in petrolatum and lard. The hydrochlorid is freely soluble in water.

INCOMPATIBILITIES: Solutions of cocain or of any of its salts after being kept a long time, or on boiling, are partly hydrolyzed into ecgonin, benzoic acid and methyl alcohol. Solutions of cocain cannot be sterilized by boiling without some loss, but the amount of decomposition is ordinarily so small as to be insignificant.

ACTION AND USES: Cocain paralyzes the peripheral nerves when applied locally, causing loss of sensation, and also contracts the blood-vessels. The mucous membrane becomes pale from local constriction of the vessels. When injected into a nerve or around the nerve sheath, anesthesia of the region to which the sensory fibers of the nerve are distributed is produced. By injecting a solution of cocain into the spinal canal anesthesia of the greater part of the body can be produced, but this method has often resulted in serious accidents or fatalities and is not to be recommended, despite the reported successful use by individuals who have become expert in recognizing and combating untoward symptoms.

Cocain produces first stimulation and then depression of the different segments of the central nervous system, beginning with the brain and extending to the spinal cord and the medulla. The stimulation of the brain has generally passed into depression before that of the spinal cord has begun, so that when considerable doses have been given the symptoms may consist of a mixture of stimulation and depression. Stimulation of the brain is shown by increased psychic activity, loss of sense of fatigue, insomnia and muscular irritability. Depression is shown by somnolence, stupor and finally coma. Convulsions frequently occur owing to cerebral action.

Respiration is at first quickened; it may have a Cheyne-Stokes character and later symptoms of respiratory paralysis appear. The heart may be temporarily stimulated, but is later paralyzed. The pulse is accelerated by nervous stimulation. The blood-pressure is raised by small doses but later falls from vasomotor paralysis. The temperature may be increased by cocain.

Cocain is a mydriatic acting both locally and centrally. The dilatation is not so complete as that produced by atropin, and reaction to light is not abolished.

The therapeutic use of cocain is derived almost exclusively from its local anesthetic properties. It is much used to secure bloodlessness and anesthesia of the mucous membranes of the conjunctiva, nose and pharynx. In the eye it is said to increase the action of other mydriatic alkaloids. It has an injurious action on the cornea in certain cases,

producing desquamation of the epithelium and causing a keratitis. It is said that the danger of such injury can be minimized by closing the eyes for some time after cocain instillations. A moist compress may also be applied when strong solutions are used. The possible danger of absorption of the drug from the conjunctiva should not be forgotten. Cocain may be used as an anesthetic in operations on the eye and is considered better than any of its substitutes by many ophthalmologists.

In the nose cocain is used for astringent purposes in early stages of coryza and other inflammations in which it renders nose breathing easier by reducing the swelling of the turbinated bodies. It is also employed for the checking of hemorrhage. For anesthetic purposes it is advantageously combined with solution of an epinephrin salt. Hemorrhage of capillary origin is particularly amenable to the use of cocain.

The painful deglutition and other inconveniences of laryngeal tuberculosis may be alleviated by local applications of cocain solutions to the ulcerated areas. A more effectual method is the injection of cocain solution into the sheath of the superior laryngeal nerve. Cocain has been much used by local application to the nasal mucous membrane or by insufflation for the relief of asthma. Swabbing the pharynx with a solution of cocain is sometimes employed to facilitate the swallowing of the stomach tube. Such an application, however, is seldom needed.

Cocain has been employed as an anti-emetic when vomiting depends on local irritation, but it should not be used for this purpose. It has also been applied as a local anesthetic to hemorrhoids, but should be used with caution.

DOSAGE: For internal use the dose is 0.015 Gm. or ¼ grain. As a local application to mucous membranes it is usually employed in the form of cocain hydrochlorid in a solution of the strength of from 2 to 10 per cent., the average being about 4 per cent. In the stronger solutions it should be used cautiously for fear of poisoning from the alkaloid absorbed. In the vagina and rectum 10 per cent. solutions of the hydrochlorid may be used, but it is not safe to use solutions stronger than from 1 to 2 per cent. in the urethra.

Cocainae Hydrochloridum (Cocain. Hydrochl.), Cocain Hydrochlorid, U. S. P. (Cocain Chlorid, Cocainum Hydrochloricum, P. I.).—The neutral hydrochlorid of the alkaloid cocain.

PROPERTIES: Cocain hydrochlorid occurs in colorless prisms, flaky, lustrous leaflets or a white, crystalline powder. It is very soluble *in water (1: 0.4)* and freely soluble in alcohol (1: 3.2).

INCOMPATIBILITIES: It is incompatible with alkalies and *sodium borate.*

DOSAGE: 0.015 Gm. or ¼ grain.

Codeina (Codein.), Codein, U. S. P.—An alkaloid obtained from opium or prepared from morphin by methylation.

PROPERTIES: Codein occurs as colorless translucent crystals or a crystalline powder, odorless and having a faintly bitter taste. Codein is slightly soluble in water (1: 120), and freely soluble in alcohol (1: 2).

ACTION AND USES: Codein is analgesic, hypnotic and sedative. It has come to be used widely in place of morphin, particularly as a sedative. Its use is less apt to lead to a habit. As an analgesic it is of value chiefly against abdominal and pelvic pain; it is largely used for cough. Codein is recommended by some authors in place of opium in the treatment of diabetes.

DOSAGE: 0.03 Gm. or ½ grain.

Codeinae Phosphas (Codein. Phos.), Codein Phosphate, U. S. P.—The phosphate of the alkaloid codein.

PROPERTIES: Codein phosphate occurs in white, needle-shaped crystals, or as a crystalline powder. It is freely soluble in water (1: 2.3) and only slightly soluble in alcohol (1: 325). It is preferred for hypodermic use.

DOSAGE: 0.03 Gm. or ½ grain.

Codeinae Sulphas (Codein. Sulph.), Codein Sulphate, U. S. P.—The sulphate of the alkaloid codein.

PROPERTIES: Codein sulphate occurs in needle-shaped crystals, or as a crystalline powder. It is soluble in water (1: 30), and very slightly soluble in alcohol (1: 1,280).

DOSAGE: 0.03 Gm. or ½ grain.

Colchici Semen (Colch. Sem.), Colchicum Seed, U. S. P. (Colchici Semen, P. I.).—The seed of *Colchicum autumnale*, yielding not less than 0.45 per cent. of colchicin.

ACTION AND USES: Colchicum produces marked irritation of the intestines, leading to looseness of the bowels with much pain and watery stools. It may produce severe inflammation and collapse. The collapse is believed to be due to the intestinal irritation and not to a central action. It also produces marked irritation of the kidney, which may lead to severe nephritis. Colchicum seed is said to be antineuralgic and analgesic. By many it is considered to be a specific in acute gout, controlling the pain and cutting short the attack. It may be given to prevent the occurrence of gouty attacks, and it is recommended by some to continue it in smaller doses after the attack.

TINCTURA COLCHICI SEMINIS (TR. COLCH. SEM.), TINCTURE OF COLCHICUM SEED, U. S. P. (Colchici Tinctura, P. I.).—One hundred Cc. represent 10 Gm. colchicum seed in approximately 55 per cent. alcohol; it should contain *about 0.04* per cent. of colchicin. It is similar to but *not identical* with the international standard tincture of *colchicum* seed.

DOSAGE: 2 Cc. or 30 minims.

In acute gout the dose is from 10 to 30 minims of the tincture once every four hours until some decided evidence of its action, such as nausea or slight purging, is induced. Severe purging should be avoided. Colchicum is of little value in rheumatism.

COLLODIA, COLLODIONS.—Collodions are solutions of pyroxylin (guncotton) in mixtures of ether and alcohol, or of acetone, and are intended for external application. The following preparations are now among those included in the Pharmacopeia:

Collodium (Collod.), Collodion, U. S. P.—A solution containing, in 100 Cc., 4 Gm. of pyroxylin, or guncotton, in a mixture of 3 volumes of ether and 1 volume of alcohol. It is used as a protective and a vehicle chiefly in the form of:

COLLODIUM FLEXILE (COLLOD. FLEX.), FLEXIBLE COLLODION U. S. P.—A mixture of collodion with camphor (2 per cent.), and castor oil (3 per cent.). The addition of the small proportion of castor oil makes the resulting film elastic and more tenacious.

Colocynthis (Colocyn.), Colocynth, U. S. P. (Colocynth Pulp, Bitter Apple, Colocynth Apple).—The dried pulp of the fruit of *Citrullus Colocynthis,* without admixture of more than 5 per cent. of seeds or more than 2 per cent. of epicarp. Colocynth belongs to the class of one-time popular hydragogue cathartics whose use appears to be on the decline. It is used in making:

EXTRACTUM COLOCYNTHIDIS (EXT. COLOCYNTH.), EXTRACT OF COLOCYNTH, U. S. P. (Powdered Extract of Colocynth).—Represents four times its weight of colocynth pulp.

DOSAGE: 0.03 Gm. or ½ grain.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM (EXT. COLOCYNTH. CO.), COMPOUND EXTRACT OF COLOCYNTH, U. S. P.—A mixture composed of extract of colocynth (16%), aloes (50%), resin of scammony (14%), cardamom seed and soap.

DOSAGE: 0.25 Gm. or 4 grains.

The extract is one of the four preparations used in making the compound cathartic pills of the U. S. P.

CONFECTIONES, CONFECTIONS. — Confections, conserves or electuaries were formerly used extensively, and usually occur as soft, pasty solids consisting of active *drugs mixed with sugar* or honey.

Copaiba (Copaib.), Copaiba, U. S. P. (Balsam of Copaiba, Copaiva).—An oleoresin derived from South American species of Copaiba.

PROPERTIES: Copaiba is a pale yellow to brownish-yellow liquid, having a peculiar, aromatic odor, and a persistent, bitter and acrid taste. It is practically insoluble in water, partially soluble in alcohol, and freely soluble in fixed and volatile oils.

ACTION AND USES: Copaiba is a mild irritant, laxative and diuretic. It stimulates and is chiefly excreted by the kidneys, but also by the bronchial mucous membrane. It sometimes produces a skin eruption closely resembling that of measles. It is slightly antiseptic.

Copaiba is sometimes used in chronic bronchitis as a stimulating expectorant. It is chiefly used in gonorrheal urethritis, being applicable only in the chronic form of the disease. It may be given in conjunction with oil of sandal or the oleoresin of cubeb.

DOSAGE: 1 Cc. or 15 minims in capsule or emulsion, four or five times a day.

Creosotum (Creosot.), Creosote, U. S. P. (Creasote).—A mixture of phenols and phenol derivatives, chiefly guaiacol and creosol, obtained during the distillation of wood-tar.

PROPERTIES: It occurs as a colorless or slightly yellowish, highly refractive, oily liquid, having a penetrating smoky odor and a burning, caustic taste. Creosote is slightly, but not completely soluble in water, and miscible in all proportions with alcohol, ether or fixed or volatile oils. Owing to its disagreeable odor and taste, it is seldom administered in the form of solution or mixture.

ACTION AND USES: Creosote acts similarly to phenol. It is antiseptic and is one of the few drugs which appear to have a just claim to be useful as intestinal antiseptics. It is used to some extent externally for its antiseptic power. It is sometimes applied locally for leukorrhea and other infections of the mucous membrane. It has been given as a stimulant expectorant in chronic bronchitis and in tuberculosis. Experiments show that it does not affect the viability of the tubercle bacilli in the lungs. Some observers assert that its favorable action in tuberculosis is due to the production of intestinal antisepsis. It must be remembered, however, that its value in tuberculosis has not been determined beyond doubt. Less reliance is placed on it than formerly.

DOSAGE: 0.25 Cc. or 4 minims three times daily. It is preferably administered in the form of pills or capsules. If it impairs the appetite and disturbs digestion its use should be abandoned.

Cresol, Cresol, U. S. P.—A mixture of isomeric cresols, $C_6H_4.CH_3.OH$, obtained from coal-tar, freed from phenol, hydrocarbons and water.

PROPERTIES: Cresol occurs as a colorless or yellowish to brown-yellow refractive liquid, having a phenol-like odor and becoming darker on exposure to light and air. It is soluble in water (1: 50) and miscible in all proportions with alcohol, petroleum benzin, ether and glycerin; it is miscible with soap solutions and with solutions of alkali hydroxids, yielding an economical form of disinfectant.

ACTIONS AND USES: Cresol is an active poison resembling phenol in its effects. Its germicidal power is approximately four times as great as that of phenol.

DOSAGE: 0.05 Cc. or 1 minim. As a disinfectant it may be used in solutions varying in strength from ¼ to 1 per cent. It is usually employed in the form of:

LIQUOR CRESOLIS COMPOSITUS (LIQ. CRESOL. CO.), COMPOUND SOLUTION OF CRESOL, U. S. P.—A mixture of equal parts of cresol and a solution of soap.

ACTION AND USES: Compound solution of cresol has about twice the germicidal power of pure phenol. On account of its saponaceous character it is much used for the disinfection of the skin, for lubricating the hands, and for vaginal douches.

DOSAGE: As a douche and for washing wounds, solutions containing from 1 to 5 per cent. are appropriate.

Cupri Sulphas (Cupr. Sulph.), Copper Sulphate, U. S. P. (Cupric Sulphate).—Contains not less than 98.5 per cent. of $CuSO_4+5H_2O$.

PROPERTIES: Copper sulphate forms large, transparent, deep-blue crystals, odorless, having a nauseous, metallic taste. Copper sulphate is freely soluble in water (1: 2.5), but only slightly soluble in alcohol (1: 500).

INCOMPATIBILITIES: Copper sulphate is incompatible with soluble salts of lead, which precipitate the insoluble sulphate of lead; with fixed alkalies and alkaline carbonates, which precipitate copper hydroxid or copper carbonate; with iodids, which form insoluble cuprous iodid with liberation of iodin, and with vegetable astringents containing tannin.

ACTION AND USES: Copper sulphate is astringent in small doses and irritant in large doses, producing nausea and vomiting. Small amounts exert a germicidal action in water containing algae, fungi or bacteria of the colon group; but when organic matter is abundantly present the germicidal action is greatly weakened. Externally copper sulphate acts as an astringent, stimulant or mild caustic according to the strength of the application.

Copper sulphate is employed as a mild caustic in trachoma. It was formerly much used as an astringent in conjunctivitis. It is sometimes administered as an emetic but is not to be recommended except in phosphorus poisoning, in which its acts by rendering the phosphorus insoluble. It is occasionally prescribed for chronic diarrhea.

DOSAGE: As an astringent in diarrhea, 0.01 Gm. or ⅙ grain; as an emetic, 0.25 Gm. or 4 grains, not to be repeated.

As a caustic it is applied as the solid crystal or in pencils made by fusing 1 part of potassium alum and 2 parts of copper sulphate. When applications are made to trachomatous lids the affected parts of the everted lids should be touched lightly with the copper stick and the eye washed out afterward with lukewarm water. Collyria containing from 1 part in 1,000 to 1 in 100 may be used.

DECOCTA, DECOCTIONS.—Decoctions are aqueous preparations made by boiling vegetable substances in water and then straining.

DIGITALIS SUBSTANCES.—This group includes as its most important members digitalis, strophanthus and squill. Others of the group are of minor importance. The drugs of the group increase the tone of the heart and arterial muscles and stimulate the vagus mechanism. In this way they slow and regulate the heart-beat, increase the cardiac output, and thus improve the circulation without affecting the blood-pressure directly. They are employed to secure compensation in valvular lesions, relieving the congestion, dyspnea, edema and other distressing symptoms and increasing the flow of urine. When administered by mouth their absorption is slow and somewhat uncertain and their effects are correspondingly delayed and cumulative, so that they must be carefully watched. Overdoses produce nausea, vomiting, diarrhea, headache, cardiac irregularities and heart-block. The emetic action of ordinary doses is not due to local irritation, as commonly supposed, but is central and therefore cannot be avoided by rectal or intravenous administrations, or by the use of special preparations or isolated principles.

Digitalis (Digit.), Digitalis, U. S. P. (Foxglove, Digitalis Folium, P. I.).—The dried leaves of *Digitalis purpurea.* When extracted and assayed biologically the minimum lethal dose should be approximately the equivalent of 0.6 mg. of digitalis for each gram of body weight of the frog. Digitalis contains a number of glucosidal principles, the most important of which are digitoxin, digitalin and digitalein, the actions of which are essentially similar. A number of preparations of these glucosids are on the market, but many are of uncertain composition, and since they have not yet demonstrated any superiority over good preparations of the whole drug, the latter are to be preferred. Digitalis is a fairly *stable drug,* and those preparations that are made with *high percentages* of alcohol retain their full activity with *little alteration* for several years. Aqueous solutions *deteriorate* more rapidly.

ACTION AND USES: Digitalis, either in substance or as one of the preparations referred to hereafter, is a cardiac tonic and diuretic. (See the preceding.)

Digitalis is useful whenever the systole of the heart is insufficient on account of incomplete exertion of its muscular power. It causes the heart to empty itself more completely and prevents it from dilating excessively during diastole. It is useful in decompensated valvular disease, in dropsy from weak heart-action and in constantly irregular pulse, which is due to fibrillation of the auricle.

DOSAGE: 0.065 Gm. or 1 grain, in powder or pill. Digitalis is a drug of variable strength, and hence a physiologically standardized preparation should be used. No perceptible effect is to be expected in less than twenty-four hours after oral administration unless larger doses are used. A slowing of the pulse indicates the beginning of its physiologic action; nausea and vomiting coming on during the administration of the drug are usually due to a commencing toxic action. If the vomiting is due to other causes, the administration of the digitalis may be continued best by a different channel, such as the rectum or the veins, or by hypodermic injection. For hypodermic and intravenous injections special preparations must be used, for which New and Nonofficial Remedies should be consulted.

OVERDOSAGE: As an overdose of digitalis or cumulative effects are most readily detected by a study of the pulse and heart action, a patient who has been given digitalis should be kept under close observation. As a rule, the conditions which require digitalis also require that the patient stay in bed.

Symptoms of digitalis poisoning are shown by nausea and vomiting, sometimes great gastro-intestinal irritation, with pain and diarrhea, a very slow pulse, followed by a rapid and feeble one, or heart-block and marked prostration. The heart may become irregular and sudden changes in position may result in great aggravation of the condition and sometimes in sudden death. On the occurrence of any of these symptoms, the administration should be suspended.

Aside from its use in powder or pills, digitalis is used largely as:

INFUSUM DIGITALIS (INF. DIGIT.), INFUSION OF DIGITALIS, U. S. P.—One hundred Cc. represent the water-soluble constituents of 1.5 Gm. digitalis in a mixture of water and cinnamon water. It should be freshly prepared.

DOSAGE: 8 Cc. or 2 fluidrams.

TINCTURA DIGITALIS (TR. DIGIT.), TINCTURE OF DIGITALIS, U. S. P. (Digitalis Tinctura, P. I.).—One hundred Cc. represent 10 Gm. digitalis in about 70 per cent. alcohol. *Assayed biologically the* minimum lethal dose should *not be greater than 0.006* Cc. for each gram of body *weight of the frog.*

DOSAGE: 0.5 Cc. or 8 minims.

Diphtheria Antitoxin.—See **Serum Antidiphthericum.**

Elaterinum (Elaterin.), Elaterin, U. S. P.—A neutral principle obtained from elaterium, a substance deposited by the juice of the fruit of *Ecballium Elaterium.*

PROPERTIES: Elaterin occurs as minute, white hexagonal scales or prismatic crystals, without odor and having a slightly acrid, bitter taste. It is practically insoluble in water and only slightly soluble in alcohol (1: 325).

Recent investigations would appear to indicate that the commercial substance is a mixture of principles. According to clinical observations, many lots of the drug have proved practically inert. Elaterin should not be confounded with elaterium.

ACTION AND USES: Elaterin is a powerful hydragogue cathartic, causing profuse watery evacuations with comparatively little pain.

It is used in dropsy, convulsions, puerperal eclampsia, etc. If used too freely or in debilitated persons it may produce dangerous weakness.

DOSAGE: 0.003 Gm. or 1/20 grain.

ELIXIRIA, ELIXIRS.—Elixirs are sweetened, aromatic, alcoholic liquids similar to cordials and having probably the same origin.

For the preparation included in this list see:

ELIXIR AROMATICUM, under **Alcohol.**

Emetinae Hydrochloridum (Emet. Hydrochl.), Emetin Hydrochloride, U. S. P.—The hydrochlorid ($C_{30}H_{44}N_2O_4.2HCl$ with not more than 19 per cent. water) of the alkaloid emetin obtained from ipecac.

PROPERTIES: Emetin hydrochlorid occurs as a white or very slightly yellowish crystalline powder, freely soluble in water or alcohol.

ACTION AND USES: Emetin acts similarly to ipecac, but is relatively more nauseant and less emetic; it causes relatively less renal irritation, but more cardiac depression. Emetin hydrochlorid has been found valuable in amebic dysentery and other diseases due to pathogenic amebas.

DOSAGE: In amebic dysentery, 0.03 Gm. (½ grain) generally given subcutaneously or intramuscularly. Expectorant, from 0.005 to 0.01 Gm. (1/12 to 1/6 grain). From 0.01 to 0.02 Gm. (1/6 to 1/3 grain) causes emesis.

EMPLASTRA, PLASTERS.—Plasters are solid preparations for external use and serve either as simple adhesives or as counterirritants. The official plasters are usually replaced by the commercial plasters made on a large scale by machinery, which have as a base a mixture of rubber, with solvents or diluents.

For the preparations included in this list see:
EMPLASTRUM BELLADONNAE, under **Belladonnae Folia.**
EMPLASTRUM SINAPIS, under **Sinapis.**

EMULSA, EMULSIONES, EMULSIONS.—Emulsions are aqueous preparations in which oils or resins are suspended by means of mucilaginous substances or other emulsifying agents.

ENEMATA, CLYSTERS.—An enema, or clyster, is a liquid preparation intended to be injected into the rectum.

Epinephrina (Epinephrin.), Epinephrin, N. N. R. (Adrenalin).—The blood-pressure-raising principle of the suprarenal gland, also produced synthetically (l-suprarenin), is official in the French, Italian and Belgian Pharmacopeias as adrenalin and in the German Pharmacopeia and the supplement to the Netherlands Pharmacopeia as suprarenin.

PROPERTIES: Chemically epinephrin is described as 1, 2-dihydroxy-4[2]-methylamino-ethyl-4[1]-ol benzene, $C_6H_3(OH)_2(CHOH.CH_2NHCH_3)$, a substance with feeble basic properties, occurring in the suprarenal gland of the sheep or other animal. As commercially obtained it is a finely crystalline white or yellowish powder, odorless and slightly bitter. The free base is practically insoluble in water and is usually dispensed in the form of an aqueous solution, 1: 1,000, of one of its salts. Epinephrin is oxidized readily and is thus destroyed in dilute alkaline solution.

ACTION AND USES: Epinephrin excites the sympathetic nerves so as to produce a variety of effects according to the function of the part supplied by the nerve. It produces a sudden rise of blood-pressure by contraction of the arterioles. The pulse is slowed as the result of the increased blood-pressure. The heart is stimulated directly, but the resistance offered by the contraction of the blood-vessels is such that at times the heart is unable to overcome it and suffers passive dilatation. The rise of blood-pressure which results from the action of this drug is very prompt but transient, lasting, as a rule, not more than five minutes. When given by the mouth it produces no evident effect on the circulation, but it is readily absorbed into the mucous membranes of the nose, mouth, urethra, vagina and rectum, producing local contraction of the blood-vessels. Very large doses are tolerated when given hypodermically on account of the slow absorption due to the constriction of the blood-vessels of the part into which it is injected. It acts promptly after intravenous injection, but is rapidly destroyed. Epinephrin dilates the pupil. It inhibits the peristaltic movements of the intestine and increases the secretion of saliva and other glands which receive their nerve-supply from the sympathetic. It relaxes bronchial *spasm. Epinephrin* may produce hyperglycemia and glycosuria, *and experiments* on rabbits indicate that its continued use may cause a degeneration of the internal coats *of the arteries.*

The chief therapeutic use of epinephrin is to constrict the peripheral blood-vessels by local application. A period of secondary dilatation follows. In this way it may be used to diminish hyperemia of the conjunctiva, to reduce swelling of the turbinated bodies, to arrest hemorrhage from the mucosa of the upper respiratory tract, and in operations on the eye, nose, ear, etc. It is successful only in capillary or small arterial bleeding, as it cannot stop a large vessel hemorrhage.

For the arrest of hemorrhage it must be applied directly to the bleeding vessels or congested area. If the blood washes it away the application may fail because it has not time to act. It may be swallowed to check hemorrhage from the stomach, but the chances of success are small because a quantity of liquid is usually present in the stomach which dilutes the remedy so that it is useless. It should not be given for internal, concealed hemorrhage, in which high blood-pressure is never desired.

Epinephrin is employed in conjunction with local anesthetics, especially cocain, to limit the absorption of the anesthetic and secure a more efficient local action. It has proved useful in relieving paroxysms of asthma both by applying a spray to the nose or throat, or by hypodermic injection.

DOSAGE: Epinephrin or one of its salts is employed in solutions of a strength of from 1:10,000 to 1:1,000. For internal or hypodermic administration the dose of a 1:1,000 solution is from 5 to 10 drops. When an oily vehicle is to be used the base itself is prescribed, but when aqueous solutions are wanted one of the salts should be employed.

Ergota (Ergot.), Ergot, U. S. P. (Secale Cornutum, P. I., Ergot of Rye, Spurred Rye).—The dried sclerotium of *Claviceps purpurea*, replacing the grain of rye. According to our present knowledge, ergot owes its activity to ergotoxin (hydroergotinin), paraoxyphenylethylamin (tyramin), histamin (imidazolylethylamin) and probably other amins of minor importance. Paraoxyphenylethylamin is closely related to epinephrin both in composition and in pharmacologic action.

ACTION AND USES: The several active principles of ergot have somewhat different actions, but the total effect is as follows:

Ergot causes powerful tonic, sometimes tetanic contractions of the uterus. It slows the pulse by stimulating the cardio-inhibitory centers. It also produces contraction of other involuntary muscles such as those of the blood-vessels, stomach and intestines, the bladder, etc. Extreme and long-continued contraction of the blood-vessels, especially of the extremities, may lead to gangrene.

The most common use of ergot is to prevent post-*partum hemorrhage*. For this purpose a full dose is often given as soon as the second stage of labor terminates, but it is much safer to give it after the placenta has been

expelled. Its use during labor should be avoided, as it may cause rupture of the uterus or asphyxia of the child. It is an effective remedy for "after-pains." Ergot is much used for hemorrhage from the uterus in menorrhagia and metrorrhagia. Its use for hemorrhage from other internal organs is not rational, as it increases blood-pressure and tends to prolong rather than check the bleeding.

Ergot has also been used for congestions in various regions, for the treatment of the early stage of acute pneumonia, for pulmonary congestion in typhoid fever, in diabetes insipidus, in colliquative night-sweats due to relaxation of the blood-vessels, and as a circulatory stimulant.

DOSAGE: 2 Gm. or 30 grains. It is sometimes administered in the form of powder.

FLUIDEXTRACTUM ERGOTAE (FLDEXT. ERGOT.), FLUIDEXTRACT OF ERGOT, U. S. P. (Secali Cornuti Extractum Fluidum, P. I.).—A hydro-alcoholic extract of ergot similar to, but not identical with, the international standard fluidextract of ergot.

DOSAGE: 2 Cc. or 30 minims.

Eucalyptus (Eucalypt.), Eucalyptus, U. S. P. (Blue Gum Leaves).—The dried leaves of *Eucalyptus Globulus* collected from the older parts of the tree. Used in medicine in the form of:

EUCALYPTOL, EUCALYPTOL, U. S. P. (Cineol).—An organic compound, obtained from the volatile oil of *Eucalyptus Globulus* and from other sources.

PROPERTIES: Eucalyptol occurs as a colorless liquid, having a distinctly camphoraceous odor, and a pungent, spicy and cooling taste. Eucalyptol is soluble in all proportions in alcohol, but is only slightly soluble in water.

DOSAGE: 0.3 Cc. or 5 minims.

OLEUM EUCALYPTI (OL. EUCALYPT.), OIL OF EUCALYPTUS, U. S. P. (Eucalyptus Oil).—The oil distilled from the fresh leaves of eucalyptus, and yielding not less than 70 per cent. of eucalyptol (cineol).

PROPERTIES: Oil of eucalyptus occurs as a colorless or pale yellow liquid, having a somewhat camphoraceous odor, and a pungent, spicy and cooling taste. It is miscible in all proportions with alcohol, but practically insoluble in water.

ACTION AND USES: Eucalyptol and oil of eucalyptus are antiseptic and expectorant. For internal use they are preferably administered in the form of capsules, and for local application in the throat or nose are used either in the form of oil sprays or are directed to be inhaled in the form of vapor from boiling water. Oil of eucalyptus, 2 Cc.; *chloroform, 3 Cc. and* castor oil, 40 Cc., mixed and taken *in two portions at* half-hour intervals, is being recommended *as an anthelmintic* for uncinariasis.

DOSAGE: 0.5 Cc. or 8 minims.

EXTRACTA, EXTRACTS.—Extracts are soft, solid or powdered preparations made by evaporating a solution of the soluble ingredients of vegetable or animal drugs at a low temperature.

For preparations included in this list see:

EXTRACTUM ALOES, under **Aloe.**

EXTRACTUM BELLADONNAE FOLIORUM, under **Belladonnae Folia.**

EXTRACTUM CASCARAE SAGRADAE, under **Cascara Sagrada.**

EXTRACTUM COLOCYNTHIDIS and EXTRACTUM COLOCYNTHIDIS COMPOSITUM, under **Colocynthis.**

EXTRACTUM FELLIS BOVIS, under **Fel Bovis.**

EXTRACTUM GENTIANÆ, under **Gentiana.**

EXTRACTUM NUCIS VOMICAE, under **Nux Vomica.**

EXTRACTUM OPII, under **Opium.**

EXTRACTUM RHEI, under **Rheum.**

Fel Bovis, Oxgall, U. S. P.—The fresh bile of the ox, *Bos taurus.* Used principally in the form of:

EXTRACTUM FELLIS BOVIS (EXT. FEL. BOV.), EXTRACT OF OXGALL, U. S. P. (Powdered Extract of Oxgall).—A light yellow powder having a peculiar odor and a bitter taste. Represents eight times its weight of oxgall.

ACTION AND USES: Extract of oxgall is an intestinal antiseptic, cholagogue and laxative. The bile salts are held to be the most powerful stimulants to the secretion of bile.

DOSAGE: 0.1 Gm. or 1½ grains. It is best administered in the form of pills or in gelatin capsules which have been treated with a solution of formaldehyd.

Ferri Carbonas, Ferrous Carbonate.

PROPERTIES: Ferrous carbonate is made by precipitating a solution of a soluble ferrous salt by a soluble carbonate. Such a precipitate tends to give off carbon dioxid, absorb oxygen and change rapidly into a basic carbonate, and finally into ferric hydroxid. Various pharmaceutical processes have been devised to prevent this change. The principle of these processes is well illustrated in the preparations described below as Vallet's mass (massa ferri carbonatis) and Blaud's pills (pilulae ferri carbonatis).

ACTION AND USES: The action of all forms of iron is essentially the same so far as the action of the iron ion is concerned. When an iron salt is taken into the stomach it may be converted into a chlorid, but this is further changed during the process of digestion. The original form in which the iron was combined seems to make little or no difference in regard to the extent or the form in which it is absorbed. A large part of the iron ingested passes through the intestines without being absorbed. A smaller portion is absorbed, mainly through the lymph, and is deposited for a time in the blood-making organs,

chiefly the spleen, where it is retained for an indefinite time as "reserve iron." Some of this supply is used in forming hemoglobin, which enters into the red blood-corpuscles. The rest is eliminated by the mucous membrane of the large intestine and only traces by the kidneys. Iron is not eliminated by the bile. The presence of iron in the blood in the amount resulting from medicinal administration produces no recognizable changes in normal individuals. Its salts with the stronger acids may act as gastro-intestinal irritants and astringents.

The only therapeutic action attributable to iron is the improvement in the number of red blood-cells and in the amount of hemoglobin in them. For this purpose it is indicated in anemia and in diseases of the blood in which anemia is a factor, such as leukemia. It is chiefly of value in anemia following hemorrhage, in chlorosis and in secondary anemias. In pernicious anemia it is useless.

MASSA FERRI CARBONATIS (MASS. FERR. CARB.), MASS OF FERROUS CARBONATE, U. S. P. (Vallet's Mass).—Contains not less than 35 per cent. of ferrous carbonate, $FeCO_3$, with honey and sugar as preservatives, and sodium sulphate resulting from the process of manufacture.

DOSAGE: 0.25 Gm. or 4 grains.

PILULAE FERRI CARBONATIS (PIL. FERR. CARB.), PILLS OF FERROUS CARBONATE, U. S. P. (Chalybeate Pills, Blaud's Pills, Ferruginous Pills).—These pills contain ferrous carbonate, potassium sulphate and sugar, with a smaller proportion of tragacanth and althea to make a mass. Each pill represents approximately 0.06 Gm. or 1 grain of ferrous carbonate. They should be made fresh when wanted.

DOSAGE: 2 pills.

Ferri Chloridum (Ferr. Chlor.), Ferric Chlorid, U. S. P. (Iron Perchlorid, Sesquichlorid of Iron).—$FeCl_3$. Used in medicine principally in the form of:

TINCTURA FERRI CHLORIDI (TR. FERR. CHLOR.), TINCTURE OF FERRIC CHLORID, U. S. P.—A hydro-alcoholic solution of $FeCl_3$, containing about 13 per cent. of the anhydrous salt, corresponding to about 4.5 per cent. of metallic iron.

PROPERTIES: Tincture of ferric chlorid is a bright amber-colored liquid, having a slightly ethereal odor, a very astringent taste and an acid reaction, miscible in all proportions with either water or alcohol.

INCOMPATIBILITIES: It is incompatible with alkalies, alkali carbonates and with tannin, and the vegetable astringents. These give an inky color to the mixture. Tincture of ferric chlorid is also incompatible with iodids, from which it liberates iodin.

ACTION AND USES: Tincture of ferric chlorid is an *astringent and is used* in applications to the throat. It *may be employed* as a hematinic, but often disturbs diges-

tion. It is also sometimes given in infections like erysipelas, but it is doubtful if it has any special value in this disease.

DOSAGE: 0.5 Cc. or 8 minims, freely diluted. Care should be taken to prevent injury to the teeth. Equal parts of the tincture, glycerin and water form a useful local application in acute tonsillitis.

Ferri et Ammonii Citras (Ferr. et Ammon. Cit.), Iron and Ammonium Citrate, U. S. P. (Soluble Ferric Citrate, Ammonio-Ferric Citrate).—Should contain the equivalent of about 17 per cent. of Fe.

PROPERTIES: It forms thin, transparent, garnet-red scales, without odor, having a saline, mildly ferruginous taste; deliquescent in moist air. It is freely and readily soluble in water, but practically insoluble in alcohol.

ACTION AND USES: Iron and ammonium citrate is one of the more widely used of the soluble preparations of iron. It is practically nonastringent. It may be directed to be dissolved in water, aromatic elixir, wine or sirup. It has been given hypodermically.

DOSAGE: 0.25 Gm. or 4 grains.

Ferri Iodidum, Ferrous Iodid.—FeI_2. A very unstable compound, easily undergoing oxidation. In order to preserve it in the ferrous condition it is commonly used in medicine in the form of sirup.

SYRUPUS FERRI IODIDI (SYR. FERR. IOD.), SYRUP OF FERROUS IODID, U. S. P. (Ferri Iodidi Syrupus, P. I.).—Contains about 5 per cent. by weight of FeI_2 and is practically identical with the international standard syrup of ferrous iodid.

PROPERTIES: Syrup of ferrous iodid occurs as a transparent pale green or yellowish green liquid having a sweet, strongly ferruginous taste and an acid reaction.

INCOMPATIBILITIES: The syrup is very susceptible to oxidation, and is incompatible with alkali carbonates, acid salts and vegetable astringents. On exposure to light the cane-sugar of the syrup undergoes gradual inversion.

ACTION AND USES: Syrup of ferrous iodid has the general properties of both iron and iodin.

DOSAGE: 1 Cc. or 15 minims, containing approximately 0.008 Gm. or ⅛ grain of iron and 0.03 Gm. or ½ grain of iodin.

Ferri Phosphas (Ferr. Phos.), Ferric Phosphate, U. S. P. (Ferri Phosphas Solubilis, U. S. P. VIII, Soluble Ferric Phosphate).—Contains not less than 12 per cent. of Fe.

PROPERTIES: Ferric phosphate occurs in thin, bright-green transparent scales without odor, and having an acidulous, slightly saline taste. *It is* freely soluble in water, but practically insoluble in *alcohol.*

INCOMPATIBILITIES: Strong acids decompose it with formation of the astringent ferric compound of the acid used. Like other soluble salts of iron it is incompatible with alkalies, alkali carbonates and vegetable astringents.

ACTION AND USES: Ferric phosphate has been recommended for the administration of iron in soluble form. It may be dissolved in water and flavored with simple elixir or sweetened with syrup.

DOSAGE: 0.25 Gm. or 4 grains.

Ferri Sulphas (Ferr. Sulph.), Ferrous Sulphate, U. S. P. (Iron Protosulphate, Green Vitriol).—$FeSO_4+7H_2O$.

PROPERTIES: Ferrous sulphate occurs as pale bluish-green crystals, without odor, having a saline, styptic taste and efflorescent in dry air. It is freely soluble in water (1: 1.4), but practically insoluble in alcohol.

ACTION AND USES: Ferrous sulphate is sometimes administered in pills as hematinic, but is used chiefly for pharmaceutical purposes, in the making of ferrous carbonate. The crude sulphate was formerly used extensively as a disinfectant and deodorant but is now seldom so employed.

DOSAGE: 0.2 Gm. or 3 grains.

FERRI SULPHAS EXSICCATUS (FERR. SULPH. EXSIC.), EXSICCATED FERROUS SULPHATE, U. S. P. (Dried Ferrous Sulphate.)—Contains not less than 80 per cent. of $FeSO_4$.—One hundred parts represent approximately 150 parts of the crystalline substance.

PROPERTIES: Exsiccated ferrous sulphate occurs as grayish-white powder, having the chemical properties of ferrous sulphate and being slowly but completely soluble in water.

Ferrum (Ferr.), Iron, U. S. P.—Metallic iron, Fe, is used pharmaceutically in the production of preparations of iron, but in medicine is used chiefly in the form of:

FERRUM REDUCTUM (FERR. REDUCT.), REDUCED IRON, U. S. P. (Ferrum Reductum, Iron by Hydrogen, Quevenne's Iron).—Contains not less than 90 per cent. of metallic iron (Fe).

PROPERTIES: Reduced iron occurs as a very fine, grayish-black powder without odor or taste, and permanent in dry air. It is insoluble in water or alcohol.

DOSAGE: 0.06 Gm. or 1 grain. Reduced iron is still widely used as a hematinic; it is given preferably in the form of powders, enclosed in capsules or cachets. It should be administered just before meals.

FLUIDEXTRACTA, FLUIDEXTRACTS. — Fluidextracts are liquid preparations of uniform and definite strength made so that each cubic centimeter represents the soluble *ingredients of 1 Gm.* of the crude drug.

For preparations included in this list see:

FLUIDEXTRACTUM CASCARAE SAGRADAE, and FLUIDEXTRACTUM CASCARAE SAGRADAE AROMATICUM, under **Cascara Sagrada.**

FLUIDEXTRACTUM ERGOTAE, under **Ergota.**

FLUIDEXTRACTUM GLYCYRRHIZAE, under **Glycyrrhiza.**

FLUIDEXTRACTUM HYDRASTIS, under **Hydrastis.**

FLUIDEXTRACTUM IPECACUANHAE, under **Ipecacuanha.**

FLUIDEXTRACTUM SENNAE, under **Senna.**

Formaldehydum, Formaldehyd.—CH_2O. Formaldehyd is commonly obtained by oxidation of methyl alcohol. It is used in medicine in the form of:

LIQUOR FORMALDEHYDI (LIQ. FORMALDEHYD.), SOLUTION OF FORMALDEHYD, U. S. P.—Often referred to in literature under the proprietary name, formalin. An aqueous solution containing not less than 37 per cent. of formaldehyd, CH_2O, largely in the polymerized form of paraformaldehyd $(CH_2O)_3$.

PROPERTIES: Solution of formaldehyd is a clear, colorless liquid, having a pungent odor and caustic taste. It is miscible in all proportions with water and alcohol. On standing it sometimes loses its transparency, owing to the separation of paraformaldehyd, a polymerization product of formaldehyd. Paraformaldehyd is also frequently formed on evaporation of the solution. Paraformaldehyd is a solid which is largely changed again into formaldehyd on heating.

INCOMPATIBILITIES: Solution of formaldehyd is incompatible with oxidizing agents and with alkalies. With ammonia it forms hexamethylenamin.

ACTION AND USES: Formaldehyd is a powerful germicide, especially valuable in the form of gas because of its penetrating power, but it is active only in the presence of an abundance of moisture. The solution is germicidal in the strength of from 1 to 2 per cent. (percentages refer to amounts of absolute formaldehyd, HCOH), but it may require from twenty to thirty minutes for it to act. In a strength of 1 : 5,000 it restrains the growth of many organisms, and in many cases a strength of 1 : 20,000 or 1 : 30,000 is sufficient to prevent the multiplication of bacteria. It is useful as a preservative of urine, although its reducing properties interfere with copper tests for sugar, and it is likely after the urine has stood for some time to cause a precipitation of albumin, if the latter is present.

It hardens tissues and is used in histology for this purpose. It has a similar hardening effect on the living skin; it is very irritating and if repeatedly or continuously applied produces reddening, inflammation and necrosis. It is applied to the skin to restrain unilateral and excessive sweating. From 1 to 10 per cent. solutions in alcohol are appropriate for this purpose. It is sometimes used for the disinfection of the hands, in connection with a solution of soap.

The use of formaldehyd for the preservation of food is condemned on account of the disturbance of digestion which *often follows* its ingestion.

The principal application of formaldehyd is in room disinfection. For this purpose the vapor must be generated in a tightly closed room, containing plenty of moisture. Several methods have been described for generating the vapor, the most convenient being by the use of potassium permanganate which, when added to the solution, by decomposing a part of the formaldehyd, generates sufficient heat to vaporize the remainder. For an ordinary-sized room 2 pounds of potassium permanganate are placed in a vessel of at least 25 quarts capacity and a mixture of 1 quart of formaldehyd solution and 1 quart of water poured on it. Intense heat is generated by the reaction of the two chemicals, and by this heat the formaldehyd is vaporized. The heat is so great as sometimes to cause fire, against which due precautions should be taken. When the mixture has been made the operator should leave the room instantly. After the disinfection is complete the irritating fumes can be neutralized by ammonia.

Gelatinum (Gelat.), Gelatin, U. S. P.—The purified air-dried product of the hydrolysis of certain animal tissues, as skin, ligaments and bones, by treatment with boiling water.

PROPERTIES: Gelatin is an amorphous, more or less transparent solid, usually shredded or in thin sheets; colorless or with a slight yellowish tint, inodorous, or having a slight, characteristic odor and a somewhat insipid taste. Unalterable in the air when dry, but putrefying rapidly when moist or in solution. Gelatin is practically insoluble in cold water, but swells and softens when immersed in it, gradually absorbing from five to ten times its weight of water. It is soluble in boiling water, acetic acid and glycerin, but is practically insoluble in alcohol, ether or chloroform.

INCOMPATIBILITIES: Gelatin is coagulated by tannin, chlorin, bromin, and mercuric chlorid. If a solution of gelatin be mixed with formaldehyd, the gelatin is rendered hard and insoluble after evaporation and drying of the residue.

ACTION AND USES: Gelatin is largely used as a food product, though its value in this respect has probably been exaggerated. It has also been used to some extent in solution for hypodermic injection to promote the formation of clot in aneurysms, and to arrest hemorrhage. There is, however, serious danger of infection from its use. Even boiling will not insure sterility as it may contain tetanus spores which are not destroyed by simple boiling. In pharmacy gelatin is used for the coating of pills, the making of gelatin capsules, gelatin disks, glycogelatin pastilles and for the making of glycerinated gelatin used as a base for suppositories.

Gentiana (Gentian.), Gentian, U. S. P. (Yellow Gentian Root).—The dried rhizome and roots of *Gentiana lutea.*

ACTION AND USES: Gentian is one of a large class of *substances with a bitter* taste which are credited with the

power of stimulating the appetite and were formerly thought to stimulate the secretion of the gastric juice. Experiments show that this effect is not due to an appreciable extent to a direct action on the mucous membrane of the stomach, but can arise only reflexly from the action of the medicine on the nerves in the mouth, chiefly those of taste.

Gentian and other bitters in moderate doses given a short time (five to fifteen minutes) before meals are useful in the treatment of loss of appetite, deficiency of the gastric secretions, chronic or subacute catarrhal gastritis, etc.

TINCTURA GENTIANAE COMPOSITA (TR. GENTIAN. CO.), COMPOUND TINCTURE OF GENTIAN, U. S. P.—A hydro-alcoholic tincture representing 10 per cent. of gentian with bitter orange peel and cardamom seed used for flavor.
DOSAGE: 4 Cc. or 1 fluidram.

EXTRACTUM GENTIANAE (EXT. GENTIAN.), EXTRACT OF GENTIAN, U. S. P.—An aqueous extract of gentian evaporated to pilular consistence.
DOSAGE: 0.25 Gm. or 4 grains.

Glycerinum (Glycerin.), Glycerin, U. S. P. (Glycerol).—$C_3H_5(OH)_3$. A liquid obtained by the decomposition of vegetable or animal fats or fixed oils. It contains not less than 95 per cent. of the trihydric alcohol, $C_3H_5(OH)_3$.

PROPERTIES: Glycerin occurs as a clear colorless liquid, of a thick, syrupy consistence, smooth to the touch, odorless or having not more than a slight, characteristic odor, a sweet taste and producing a sensation of warmth in the mouth. It is readily miscible with water or alcohol.

ACTION AND USES: Glycerin is used in medicine chiefly as a solvent in preparing glycerites, and as a sweetening agent or vehicle in place of syrups.

SUPPOSITORIA GLYCERINI (SUPPOS. GLYCERIN.), SUPPOSITORIES OF GLYCERIN, U. S. P.—Each suppository contains approximately 3 Gm. or 45 grains of glycerin gelatinized by means of stearic acid soap.

ACTION AND USES: A glycerin suppository, or glycerin itself, when introduced into the rectum tends to absorb water from the surrounding tissues and to cause increased peristalsis by reflex action, thus acting as a prompt laxative.

GLYCERITA, GLYCERITES.—Glycerites are solutions of medicinal substances in glycerin.

For preparations of this type included in this list see:

GLYCERITUM ACIDI TANNICI, under **Acidum Tannicum.**

GLYCERITUM BOROGLYCERINI, under **Acidum Boricum.**

Glycerylis Nitras, Glyceryl Trinitrate (Nitroglycerin, Trinitrin, Glonoin).—A compound of glyceryl with nitric acid obtained by the action of nitric acid on glycerol *in the* presence of sulphuric acid.

PROPERTIES: Nitroglycerin is a moderately volatile explosive liquid slightly soluble in water, but quite soluble in alcohol.

ACTION AND USES: Although a nitrate, nitroglycerin has the physiologic action of nitrites but acts more slowly than amyl nitrite. It may be given when it is desired to effect a steady reduction of the arterial pressure, but it gradually becomes inefficient. It may be prescribed in arteriosclerosis, and in nephritis in which a high blood pressure is a prominent symptom. It is used with success in some cases of angina pectoris. It is sometimes combined with digitalis in order to neutralize the contraction of the arterioles by the digitalis under the belief that therapeutic doses of digitalis exert a pronounced vasoconstrictor action.

SPIRITUS GLYCERYLIS NITRATIS (SP. GLYCERYL. NIT.), SPIRIT OF GLYCERYL TRINITRATE, U. S. P. (SPIRIT OF GLONOIN, SPIRIT OF NITROGLYCERIN).—An alcoholic solution containing about 1 per cent. by weight of glyceryl trinitrate.

PROPERTIES: Spirit of Glyceryl Nitrate is a clear, colorless liquid, having the odor and taste of alcohol. Caution should be exercised in tasting it, since even a small quantity of it is liable to produce violent headache.

DOSAGE: 0.05 Cc. or 1 minim three or more times a day.

Glycyrrhiza (Glycyrrh.), Glycyrrhiza, U. S. P. (Licorice, Liquorice Root).—The dried rhizome and root of *Glycyrrhiza glabra typica* (Spanish licorice), or of *Glycyrrhiza glabra glandulifera* (Russian licorice). Used in medicine chiefly as a vehicle and principally in the form of:

FLUIDEXTRACTUM GLYCYRRHIZAE (FLDEXT. GLYCYRRH.), FLUIDEXTRACT OF GLYCYRRHIZA, U. S. P. (FLUIDEXTRACT OF LICORICE).—An aqueous extract of glycyrrhiza preserved by means of glycerin and alcohol.

AVERAGE DOSE: 2 Cc. or 30 minims.

A simple mixture of 12 Cc. of fluidextract of glycyrrhiza and 88 Cc. of aromatic elixir is official in the U. S. P. as "elixir glycyrrhizae."

Glycyrrhiza in the form of powder is used as a flavoring agent and vehicle in connection with:

PULVIS GLYCYRRHIZAE COMPOSITUS, which see under **Senna.**

Guaiacol, Guaiacol, U. S. P.—Guaiacol is one of the chief constituents of wood-tar creosote.

PROPERTIES: Guaiacol is a colorless or yellowish, strongly refractive liquid or a nearly colorless crystalline solid, having an agreeable aromatic odor. It becomes darker on exposure to light and air. Guaiacol is soluble in water (1: 53), and miscible with alcohol in all proportions.

ACTION AND USES: Guaiacol is antiseptic and germicidal, but is milder than creosote. When rubbed on the skin it is absorbed. When given in this way it is an active *antipyretic*, but its action is not easily controlled. It is an *intestinal antiseptic* and also an expectorant. It is not *excreted by the lungs*, however.

DOSAGE: Guaiacol may be given in emulsion or in the form of capsules. The initial dose should not exceed 0.1 Cc. or about 1½ minims, gradually increased to 0.6 Cc. or 10 minims, if well borne. It is sometimes applied to the pharynx as a 50 per cent. solution in glycerin. The local use of guaiacol as an antipyretic is not to be recommended on account of the symptoms of collapse which sometimes follow these applications.

Guaiacolis Carbonas (Guaiacol. Carb.), Guaiacol Carbonate, U. S. P.—A guaiacol derivative $[C_6H_4(OCH_3)]_2CO_3$.

PROPERTIES: Guaiacol carbonate is a white crystalline powder of neutral reaction, almost tasteless and odorless. It is practically insoluble in water, but is soluble in alcohol (1: 60). It is decomposed readily with the liberation of guaiacol.

INCOMPATIBILITIES: It is incompatible with alkaline hydroxids.

ACTION AND USES: Guaiacol carbonate is inactive until decomposed with the liberation of guaiacol. This occurs only in the presence of putrefactive organisms so that in the intestine it acts only when an antiseptic is needed and the excess fails to be absorbed and is excreted with the feces. Consequently it is ordinarily not poisonous. It is used internally as a tasteless and non-poisonous substitute for guaiacol.

DOSAGE: 1 Gm. or 15 grains. It may be given in powders, capsules or cachets.

Heroin Hydrochlorid.—See **Diacetylmorphinae Hydrochloridum.**

Hexamethylenamina (Hexam.), Hexamethylenamin, U. S. P. (Hexamethylene-tetramine).—This preparation is also known under several trade names, of which aminoform, formin and urotropin are included in N. N. R.

Hexamethylenamin or hexamethylenetetramin, $(CH_2)_6N_4$, is a condensation product of ammonia and formaldehyd.

PROPERTIES: Hexamethylenamin forms colorless, lustrous, odorless crystals, freely soluble in water (1:1.5) and alcohol (1: 12.5). The aqueous solution has an alkaline reaction. Hexamethylenamin is a base which combines with acids to form salts. These salts tend to lose formaldehyd, and most acids decompose the base completely with the liberation of formaldehyd. Even in aqueous solution a slow separation of formaldehyd occurs. The basic properties of hexamethylenamin are so pronounced that it displaces ammonia and other weak bases from their combinations.

INCOMPATIBILITIES: Hexamethylenamin is incompatible with acids which liberate formaldehyd and with salts of ammonium from which it separates ammonia. Acid salts like acid sodium phosphate and combined acids like acetylsalicylic acid (aspirin) react with it like other acids. It is also incompatible with tannin and mercuric chlorid, which *precipitate* hexamethylenamin.

ACTION AND USES: Hexamethylenamin produces no marked physiologic effects except those of formaldehyd, to which it gives rise. It is excreted in the urine, the bile, the cerebrospinal fluid and other serous fluids and by the mucous membranes of the respiratory tract and of the middle ear. When the urine is acid hexamethylenamin is decomposed, yielding formaldehyd. This product exercises a strong antiseptic action on the mucous membrane of the genito-urinary tract. When the urine is alkaline the decomposition does not occur. Formaldehyd is an excellent solvent of uric acid and hexamethylenamin has been used in the hope of dissolving uric acid calculi, tophi, gravel, etc., and has been thought to increase the elimination of uric acid. Its use for this purpose, however, has practically been abandoned.

The chief use of hexamethylenamin is as a urinary antiseptic. It tends to free the urine from micro-organisms, and in many cases causes pus to disappear. It is of great value as a prophylactic in operations on the urinary organs. It is valuable in cystitis, pyelitis, etc. It is employed as a prophylactic in the bacilluria of typhoid fever. Some advocate its routine use to prevent the occurrence of this complication. It has been recommended to prevent the onset of nephritis in scarlet fever. As it has produced albuminuria and hematuria in some cases, it should be used with caution in cases in which inflammation of the kidney is present or anticipated.

In view of its excretion into the spinal canal, it has been recommended in cerebrospinal meningitis and in poliomyelitis, but, since the cerebrospinal fluid is not acid, hexamethylenamin cannot exert any antiseptic action there. There is a tendency to extend its employment to infections of the respiratory tract and to the treatment of catarrh of the intestine and biliary passages. Favorable reports have been made of its use in rhinitis, otitis, bronchitis, etc., but further investigations are necessary to establish its efficiency. There is no good reason to expect a therapeutic action from it in situations in which the secretions are not distinctly acid.

DOSAGE: 0.3 Gm. or 5 grains three or four times a day in half a glass of water.

Homatropinae Hydrobromidum (Homatrop. Hydrobr.), Homatropin Hydrobromid, U. S. P. (Homatropin Bromfid).—The hydrobromid of an alkaloid, tropin mandelate, produced synthetically.

PROPERTIES: It usually occurs as a white, odorless, crystalline powder, having a bitter taste. Caution must be observed in tasting it. It is freely soluble in water (1:6) and soluble in alcohol (1:40).

INCOMPATIBILITIES: Homatropin hydrobromid has the ordinary incompatibilities of the salts of alkaloids.

ACTION AND USES: The actions of homatropin are identical with those of atropin, except for the fact that the dilatation produced by it occurs more promptly and dis-

appears in about eighteen hours. When applied freely to the conjunctiva it may be absorbed so that the bitter taste can be perceived, but the throat does not become dry as after atropin. The effect of this drug is increased by mixture with cocain.

DOSAGE: 0.5 mg. or 1/120 grain. Homatropin is used chiefly as a mydriatic in place of atropin. It may be used in aqueous solution of 2 per cent. strength, or a drop of a 1:500 solution may be introduced into the conjunctival sac every five minutes for five times to produce a maximum dilatation in three-quarters of an hour. This will return to normal in from fourteen to eighteen hours.

Hydrargyri Chloridum Corrosivum (Hydrarg. Chlor. Corr.), Corrosive Mercuric Chlorid, U. S. P. (Bichlorid of Mercury, Corrosive Sublimate, Mercuric Chlorid, Perchlorid of Mercury).—Contains not less than 99.5 per cent. of $HgCl_2$.

PROPERTIES: Mercuric chlorid occurs in the form of heavy colorless crystals or a heavy white powder having an acrid and persistent metallic taste. It is permanent in the air. It is very slowly soluble in water (1:13.5), and freely soluble in alcohol (1:3.8). Ammonium chlorid, sodium chlorid, tartaric acid and citric acid enhance its solubility in water.

INCOMPATIBILITIES: Mercuric chlorid is precipitated from its solutions by albumin, but redissolves in an excess of the albumin solution. Albumin in the form of egg-white forms the most useful antidote to corrosive sublimate, but a great excess should be avoided and the antidote should be followed by an emetic.

Mercuric chlorid is incompatible with soluble carbonates and hydroxids, forming insoluble mercuric oxid, and with iodids, forming mercuric iodid or complex mercuric iodids. It is incompatible with many alkaloids and other organic compounds. It is reduced to calomel or metallic mercury by iron, zinc and reducing agents in general. It dulls and tarnishes surgical instruments.

ACTION AND USES: Mercuric chlorid is chiefly used as a germicide and an antiseptic. It is also sometimes used as a specific antisyphilitic agent. In a proportion of 1:20,000 it kills non-spore bearing bacilli and in the proportion of 1:300,000 inhibits the growth of many bacteria. Spores of *Bacillus anthracis* are killed by a solution of 1:1,000. Its disinfectant action is limited by its deficient penetration and by the fact that it is greatly reduced by combination with organic matter. Mercuric chlorid is irritant to the skin, setting up a dermatitis. A sufficient amount may be absorbed from the skin to produce serious poisoning. The effects of the poison when absorbed from the skin or mucous membranes are seen in gastro-intestinal irritation, diarrhea, frequent foul-smelling and bloody passages resembling those of dysentery, various nervous symptoms, marked weakness, irritation of the kidneys with albumin and casts in the urine, leading to anuria, etc. When taken

poisonous doses by the mouth it produces, in addition, irritation and ulceration of the mouth and throat, vomiting and corrosion of the mucosa of the stomach and intestines. Salivation and swelling and ulceration of the gums sometimes occur.

Dilute solutions of mercuric chlorid are used by hypodermic or intramuscular injection in the treatment of syphilis. The injections must be repeated daily and have the disadvantage of causing considerable pain.

Mercuric chlorid is used as a local application to the skin in some forms of skin disease, sometimes as an antiseptic, but also for the purpose of producing exfoliation of the epidermis. It is sometimes used in 1 per cent. alcoholic solution as an application to corneal ulcers. In the proportion of 1:5,000 it may be added to collyria to prevent fungus growths.

DOSAGE: From 0.002 to 0.01 Gm., or from 1/30 to 1/6 grain, in solution or in pill form. As an antiseptic application it may be used in solutions varying in strength from 1:20,000 to 1:2,000. For disinfection of clothing a solution of 1:1,000 may be used. To excite dermatitis and exfoliation, solutions varying in strength from 1:1,000 to 1:200 may be used, but caution should always be exercised in employing the stronger solutions for fear of absorption of the poison. The injection of mercuric chlorid solutions into the body cavities should be undertaken only with the greatest caution.

Hydrargyri Chloridum Mite (Hydrarg. Chlor. Mit.), Mild Mercurous Chlorid, U. S. P. (Mercurous Chlorid, Calomel, Protochlorid of Mercury, Subchlorid of Mercury).—Contains not less than 99.6 per cent. of HgCl.

PROPERTIES: Mild mercurous chlorid is a white impalpable powder, becoming yellowish-white on trituration with strong pressure, odorless, tasteless and permanent in the air. It is practically insoluble in water, alcohol or ether. It undergoes changes when exposed to the action of light or under the influence of alkaline chlorids, bromids or iodids, by which mercuric salts are more or less rapidly formed. The mercuric salt enters into solution in combination with the salt of the alkali metal present. Alkaline hydroxids convert it into mercurous oxid; ammonia forms with it a mixture of mercury and mercuric ammonium chlorid.

INCOMPATIBILITIES: Calomel is incompatible with alkalies, with oxidizing acids like nitric acid and also with soluble bromids and iodids. The fear that non-oxidizing acids like hydrochloric acid will form mercuric chlorid from it is unfounded. Calomel is not incompatible with such acids.

ACTION AND USES: Mild mercurous chlorid is not irritating to the mucous membrane of the mouth, esophagus and stomach, but it provokes bowel movements by a slow action. This action has been thought to be due to a partial change into a mercuric salt or a protein compound. The absorption of the mercuric salt may produce symptoms of subacute mercurial poisoning. The chief indications of toxic effects are pain in the abdomen, loose passages, salivation,

loosening of the teeth, swelling, soreness and ulceration of the gums, foul breath and general malaise.

Calomel was formerly supposed to have a cholagogue action, but it does not increase the quantity of bile secreted, although by its cathartic action it may increase temporarily the amount poured out by the intestine. The stools resulting from the action of calomel are frequently greenish, resulting from changes in the bilirubin; this is partly because the bilirubin in the intestinal contents, being hurried through the colon, fails to undergo the change into urobilin which normally occurs. The change in color may also be due in part to the formation of mercuric sulphid.

Calomel is used for a special effect on the gastro-intestinal tract which is attributed in part to an antiseptic action. It is thought to be of special value as a cathartic in gastro-enteritis and at the beginning of mild catarrhs of the stomach and intestines. It is also frequently used to empty the bowels in conjunction with the more active salines in cases of infection, or toxemia. It is sometimes useful in small doses to check vomiting and is frequently administered as a laxative when the stomach is irritable because it is retained better than other cathartics. It is useful as an intestinal antiseptic.

Calomel is sometimes an excellent diuretic in cardiac dropsy, in which condition its absorption must be secured through the control of the purgative action. It is of much less value in other forms of dropsy.

It is applied externally to sluggish ulcers, and is used by insufflation on the cornea for ulceration or opacities, phlyctenular conjunctivitis, etc.

DOSAGE: Only a small portion of the calomel is absorbed, so that minute doses are generally effective. From 0.005 to 0.02 Gm., or from 1/12 to 1/3 grain may be given every half hour or hour until from 0.1 to 0.2 Gm., or from 1½ to 3 grains have been given. The calomel should be followed in a few hours or the next morning by a saline cathartic. When calomel is used externally, care should be taken that no iodids are administered internally at the same time, because the presence of iodids in the secretions, for example, tears, may cause the formation of a mercuric salt and induce great irritation.

Hydrargyri Iodidum Flavum (Hydrarg. Iod. Flav.), Yellow Mercurous Iodid, U. S. P. (Mercurous Iodid, Protiodid of Mercury, Yellow Iodid of Mercury, formerly also called "Green Iodid of Mercury").—Contains not less than 99 per cent. of HgI.

PROPERTIES: Mercurous iodid is a bright yellow, amorphous powder, odorless and tasteless. By exposure to light it becomes darker, in proportion as it undergoes decomposition into mercuric iodid and metallic mercury. It is almost insoluble in water and wholly insoluble in alcohol.

INCOMPATIBILITIES: Mercurous iodid is incompatible with oxidizing agents, alkalies and the haloid salts of the alkali metals (chlorids, bromids or iodids), which tend to decom-

pose it with the formation of mercuric salts. Alkali iodids decompose mercurous iodid with formation of metallic mercury and soluble alkali mercuric iodid.

ACTION AND USES: Mercurous iodid is used to secure the constitutional effects of mercury, especially in the treatment of syphilis. Its effects are much the same as those of calomel, although it is not so likely to produce diarrhea or salivation as the latter preparation. It has been largely displaced by the more efficient injection treatments.

DOSAGE: In syphilis mercurous iodid is best given in pill form in doses gradually increasing until slight toxic symptoms appear in the form of pain in the abdomen, diarrhea, salivation, etc. During its administration careful attention should be given to cleanliness of the mouth and skin. The teeth should be kept in good order, and soreness of the gums should be the signal for interrupting temporarily the administration of the remedy. The initial dose should not exceed 0.015 Gm. or ¼ grain in the form of a tablet, pill or powder, three times a day after meals, and this should be increased by the addition of 0.008 Gm. or ⅛ grain daily to the limit of tolerance.

Hydrargyri Iodidum Rubrum (Hydrarg. Iod. Rub.), Red Mercuric Iodid, U. S. P. (Biniodid of Mercury, Mercuric Iodid, Red Iodid of Mercury).—Contains not less than 99 per cent. of HgI_2.

PROPERTIES: Mercuric iodid is a scarlet-red powder, odorless and tasteless, and permanent in the air. It is nearly insoluble in water, but slightly soluble in alcohol (1: 115). It is rendered soluble in the presence of soluble iodids, such as an equal weight of potassium iodid with formation of potassium mercuric iodid.

INCOMPATIBILITIES: Red mercuric iodid is incompatible with alkalies and their carbonates and alkaloids and their salts.

ACTION AND USES: Mercuric iodid is used as an antiseptic and germicide. It is more powerfully antiseptic than mercuric chlorid. It may be applied in potassium iodid solution. It is also used for the internal administration of mercury. A solution of mercuric iodid in sodium iodid (mercuric iodid 1 Gm., sodium iodid 3 Gm., water to make 100 Cc.) is used as a means of administering mercury by intramuscular injection.

DOSAGE: 0.003 Gm. or 1/20 grain three times a day. It is frequently formed for internal administration by the prescription of a mixture of corrosive mercuric chlorid and potassium iodid.

	Gm. or Cc.
℞ *Hydrargyri chloridi* corrosivi	0\060
Potassii iodidi	6\00
Aquae	100\

[M.]

Hydrargyri Oxidum Flavum (Hydrarg. Oxid. Flav.), Yellow Mercuric Oxid, U. S. P.—Contains not less than 99.5 per cent. of HgO.

PROPERTIES: Yellow mercuric oxid is a light orange-yellow, amorphous powder, odorless and having a somewhat metallic taste. It is permanent in the air, but turns darker on exposure to light. It is nearly insoluble in water and in alcohol.

INCOMPATIBILITIES: Yellow mercuric oxid is incompatible with acids, which dissolve it, forming mercuric salts.

ACTION AND USES: Yellow mercuric oxid is employed externally as a stimulant and parasiticide. Its chief use is in blepharitis, phlyctenular conjunctivitis, etc., in which it acts as a stimulant.

DOSAGE: Yellow mercuric oxid should be used in the strength necessary to stimulate without producing unnecessary irritation. Ointments varying in strength from 0.1 to 2 per cent. are prescribed.

UNGUENTUM HYDRARGYRI OXIDI FLAVI (UNG. HYDRARG. OXID. FLAV.), OINTMENT OF YELLOW MERCURIC OXID, U. S. P.—A 10 per cent. mixture of yellow mercuric oxid, with water, hydrous wool-fat and petrolatum.

DOSAGE: For use in the eye it should be diluted with from 10 to 100 parts of petrolatum so as to reduce the percentage of mercuric oxid to from 1 to 0.1 per cent.

Hydrargyri Salicylas (Hydrarg. Salicyl.), Mercuric Salicylate, U. S. P. (Mercuric Subsalicylate).—A mercuric salt of salicylic acid in which one atom of mercury is combined with one molecule of salicylic acid. It contains from 54 to 59.5 per cent. of Hg.

PROPERTIES: Mercuric salicylate is a white or slightly yellowish or pinkish amorphous powder, tasteless, odorless and neutral to litmus paper. It is nearly insoluble in water or alcohol, but soluble at the ordinary temperature in solutions of sodium hydroxid or sodium carbonate with the formation of a double salt.

INCOMPATIBILITIES: Mercuric salicylate is incompatible with iodids and (probably) other halogen salts.

ACTION AND USES: Mercuric salicylate is used as an antiseptic and for producing the internal actions of mercury. It is much used by hypodermic or intramuscular injection in the treatment of syphilis.

DOSAGE: Mercuric salicylate is given by intramuscular injection in a 10 per cent. suspension in liquid petrolatum; 0.6 Cc. or 10 minims of this suspension are injected once in four days. It is held by some clinicians that the introduction by the mouth of sufficient mercury to eradicate syphilis thoroughly is practically impossible.

Hydrargyrum (Hydrarg.), Mercury, U. S. P. (Quicksilver).—*Contains not* less than 99.5 per cent. of Hg.

PROPERTIES: Metallic mercury in its ordinary form is a shining, silver-white, volatile and fluid metal without odor or taste. In its massive form it has comparatively little physiologic action and is not poisonous even in large quantities. When it has been reduced to a fine state of subdivision it is capable of absorption either by the skin or mucous membranes, and then produces the ordinary pharmacologic effects of its salts. It is also very active in the form of vapor.

Mercury is widely used in the form of the following mixtures:

HYDRARGYRUM CUM CRETA (HYDRARG. CUM CRET.), MERCURY WITH CHALK, U. S. P. (Gray Powder).—A powder containing about 38 per cent. of mercury with clarified honey and prepared chalk.

PROPERTIES: By long shaking and trituration of the mercury with the other ingredients it is reduced to so fine a state of subdivision that distinct globules cannot be seen with a lens magnifying 4 diameters. The preparation then forms a light gray, slightly adhesive powder, with little odor, and a slightly sweetish taste.

ACTION AND USES: This preparation is used in general in the same way as calomel, but it is less irritating to the intestines and in some cases does not move the bowels because of the antagonizing influence of the chalk. It is often used to secure the constitutional effects of mercury in cases of infantile and hereditary syphilis.

DOSAGE: 0.25 Gm. or 4 grains, containing approximately 0.1 Gm. or 1½ grains of metallic mercury.

MASSA HYDRARGYRI (MASS. HYDRARG.), MASS OF MERCURY, U. S. P. (Blue Mass).—A mixture of 33 per cent. of mercury with glycyrrhiza, althea, glycerin and honey of rose. The mercury is reduced to such fine division that globules are not visible under a magnification of 10 diameters.

ACTION AND USES: The effects of and indications for this preparation are much the same as those of calomel. It may be used as a laxative.

DOSAGE: 0.250 Gm. or 4 grains.

UNGUENTUM HYDRARGYRI (UNG. HYDRARG.), MERCURIAL OINTMENT, U. S. P.—A mixture of 50 per cent. of mercury with prepared suet, benzoinated lard and 2 per cent. of oleate of mercury. The mercury is reduced by trituration to such fineness that globules are no longer visible under a lens magnifying 10 diameters.

UNGUENTUM HYDRARGYRI DILUTUM (UNG. HYDRARG. DIL.), DILUTED MERCURIAL OINTMENT, U. S. P. (Blue Ointment, Hydrargyri Unguentum, P. I.).—Blue ointment is made by mixing 2 parts of mercurial ointment with 1 part of petrolatum. It represents approximately 33 per cent. of metallic mercury and conforms to the strength, though not to the composition of the international standard for mercurial ointment.

ACTION AND USES: Mercurial ointment is a parasiticide; *it is employed* for the destruction of lice, but other mea-

sures are more cleanly and less calculated to cause irritation. The rubbing of mercurial ointment into the skin allows the absorption of a part of the mercury, thus securing its constitutional effects. This is regarded by some authorities as the most efficacious method of treating syphilis except the intravenous or hypodermic method. Inunction has the great advantage of leaving the digestive tract undisturbed.

DOSAGE: 2 Gm. or 30 grains of the ointment should be rubbed into a chosen area of the skin at night, and the part anointed should be cleansed by washing in the morning. A new area of the skin should be chosen for inunction the next evening. The ointment may be spread on cloths and bound on a part of the skin liable to some friction. If dermatitis is excited by this method of application it will subside rapidly as a rule on washing with a warm alkaline lotion and dusting with some bland powder. If irritation seems likely to arise the ointment may be diluted with an equal part of hydrous wool fat.

Hydrargyrum Ammoniatum (Hydrarg. Ammon.), Ammoniated Mercury, U. S. P. (White Precipitate).—A mercuric ammonium chlorid produced by the precipitation of a solution of mercuric chlorid by a solution of ammonia; it should correspond to from 78 to 80 per cent. of metallic mercury.

PROPERTIES: Ammoniated mercury forms white pulverulent pieces or a white amorphous powder, having an earthy, afterward styptic and metallic taste. It is practically insoluble in water or in alcohol, but is gradually decomposed by washing with water. It is readily soluble in warm acids with decomposition. It also dissolves in cold solution of ammonium carbonate.

Ammoniated mercury is chiefly used in the form of:

UNGUENTUM HYDRARGYRI AMMONIATI (UNG. HYDRARG. AMMON.), OINTMENT OF AMMONIATED MERCURY, U. S. P. (White Precipitate Ointment).—A mixture of 10 per cent. of ammoniated mercury with white petrolatum and hydrous wool-fat.

ACTION AND USES: Ammoniated mercury in the form of an ointment of from 2 to 10 per cent. is used as an antiseptic and local stimulant. In the strength of from 3 to 5 per cent. it is an efficient and non-irritating application for small areas of suppurating dermatitis. In stronger proportions (from 8 to 12 per cent.) it is a useful stimulating ointment for exciting a healthy inflammatory reaction, as in psoriasis. In seborrhea it may be applied after removal of crusts, in the form of a 2 per cent. ointment.

Hydrastininae Hydrochloridum (Hydrastinin. Hydrochl.), Hydrastinine Hydrochlorid, U. S. P. (Hydrastinine Chlorid).—The hydrochlorid of hydrastinine, an alkaloid obtained by the oxidation of hydrastine.

PROPERTIES: Hydrastinine hydrochlorid occurs in yellowish white, odorless crystals or crystalline powder. It is very soluble in water and in alcohol.

ACTION AND USES: Hydrastinine hydrochlorid has marked influence in raising blood pressure, and a much greater stimulating effect on the uterus than hydrastine. It is chiefly employed to check uterine hemorrhage.

DOSAGE: 0.03 Gm. or ½ grain.

Hydrastis, Hydrastis, U. S. P. (Golden Seal).—The dried rhizome and roots of *Hydrastis canadensis,* yielding when assayed by the process given in the U. S. Pharmacopeia not less than 2.5 per cent. of the ether-soluble alkaloids (chiefly hydrastine) of hydrastis. Hydrastis contains also berberine, an alkaloid having the properties of a simple bitter.

ACTION AND USES: Hydrastis, though disagreeable in taste, possesses the tonic and appetizing properties of other bitters. It has also been said to have a special influence on mucous membranes, promoting their nutrition and favoring their return to a normal condition. For this property there is no experimental evidence, and in the opinion of some its existence is doubtful. The action of hydrastis on the circulation is not well understood, but it is believed that the drug stimulates the circulation and raises the blood-pressure. It has a stimulating influence on the uterus, and has been employed to check menorrhagia and metrorrhagia.

FLUIDEXTRACTUM HYDRASTIS (FLDEXT. HYDRAST.), FLUID-EXTRACT OF HYDRASTIS, U. S. P. (Fluid Extract of Golden Seal).—A solution of the soluble constituents of hydrastis in a mixture of glycerin, alcohol and water. One hundred Cc. should contain 2 Gm. of the ether-soluble alkaloids of hydrastis.

DOSAGE: 2 Cc. or 30 minims.

Hydrogenii Dioxidum, Hydrogen Dioxid (Hydrogen Peroxid).—Hydrogen dioxid or peroxid, H_2O_2, is a syrupy liquid, which has a strong tendency to decompose into water and oxygen in the presence of oxidizable substances and of ferments capable of carrying oxygen. It is soluble in water, alcohol and ether. It decomposes readily when heated. Strong solutions are more stable than are dilute solutions.

LIQUOR HYDROGENII DIOXIDI (LIQ. HYDROG. DIOX.), SOLUTION OF HYDROGEN DIOXID, U. S. P. (Aqua Hydrogenii Dioxidi, U. S. P. VIII, Solution of Hydrogen Peroxid).—A slightly acid, aqueous solution of H_2O_2 (approximately 3 per cent.) corresponding to about 10 volumes of available oxygen.

PROPERTIES: Solution of hydrogen dioxid is a colorless liquid *without odor, but having* a slightly acidulous taste and producing a *peculiar sensation* and thick froth in the mouth. It is prone to *deteriorate on keeping.*

ACTION AND USES: By its power of giving off oxygen it becomes a germicide and is employed as a nontoxic antiseptic application to suppurating wounds, inflamed mucous membranes, etc. It is employed as a topical application in the throat in diphtheria and other inflammatory exudates.

DOSAGE: Solution of hydrogen dioxid is usually applied diluted with from 1 to 4 volumes of water. It should be used with care in deep cavities. A free opening for the escape of foam and gas should be provided.

Hyoscyamus (Hyosc.), Hyoscyamus, U. S. P. (Henbane, Hyoscyami folium, P. I.).—The dried leaves and flowering tops of *Hyoscyamus niger* yielding not less than 0.065 per cent. of the alkaloids of hyoscyamus.

TINCTURA HYOSCYAMI (TR. HYOSC.), TINCTURE OF HYOSCYAMUS, U. S. P.—One hundred Cc. represent the soluble constituents of 10 Gm. of hyoscyamus in diluted alcohol, and contain approximately 0.0065 Gm. of the total alkaloids of hyoscyamus.

ACTION AND USES: The uses of tincture of hyoscyamus are similar to those of tincture of belladonna. It is thought to be more sedative to the nervous system.

DOSAGE: From 0.6 to 2 Cc. or from 10 to 30 minims.

Hypophysis Sicca (Hypophysis Sic.), Desiccated Hypophysis, U. S. P. (Desiccated Pituitary Body).—The posterior lobe obtained from the pituitary body of cattle, cleaned, dried and powdered.

PROPERTIES: Amorphous powder having a characteristic odor. It is only partially soluble in water. Preferably used in the form of:

LIQUOR HYPOPHYSIS (LIQ. HYPOPHYSIS), SOLUTION OF HYPOPHYSIS, U. S. P. (Solution of the Pituitary Body).—A solution containing the water-soluble principle or principles from the fresh posterior lobe of the pituitary body of cattle; commercial preparations are generally supplied in sealed ampules.

PROPERTIES: Solution of hypophysis is a clear, colorless liquid having a faint but characteristic odor. It has the same activity on the isolated uterus of the virgin guinea-pig as a 1: 1000 solution of beta-iminazolyl-ethylamine hydrochlorid.

ACTION AND USES: Solution of hypophysis stimulates plain muscle, especially that of the blood vessels and the uterus. Injected subcutaneously or intramuscularly, it is used to stimulate uterine contractions in labor. It should not be employed during the first stage of labor, because, if the os uteri is not fully open, the energetic contractions may cause rupture of the uterus. It has also been recommended in uterine hemorrhage and certain cases of pulmonary hemorrhage, in shock and various other conditions

of low blood pressure, and in postoperative intestinal paresis. Its administration by mouth is practically ineffective.

DOSAGE: 1 Cc. or 15 minims.

Ichthyol, Ichthyol, N. N. R. (Ammonium Ichthyol).—An aqueous solution, the important medicinal constituents of which are ammonium compounds containing sulphur in the form of sulphonates, sulphones and sulphids. These are prepared from the tar-like distillate obtained from certain bituminous shales containing the fossil remains of fish, which are found in Tyrol and elsewhere.

PROPERTIES: Ichthyol is a reddish brown to brown-black syrupy liquid having a characteristic empyreumatic odor and burning taste. It is miscible in all proportions with water, glycerol or oils, but is incompletely soluble in alcohol. Its aqueous solution has a faintly acid reaction.

ACTION AND USES: The actions of ichthyol are not well understood. It penetrates the unbroken skin to a certain extent. It is said to act as a vasoconstrictor on mucous surfaces. It has mildly antiseptic action.

It is applied to the skin in inflammatory conditions such as erysipelas, acne vulgaris, rosacea, lupus erythematosus, etc., to lessen hyperemia. It has also been used internally, but it is impossible at present to determine its true value. It has no specific action in tuberculosis, although it has seemed to increase appetite and strength in some cases. It has been tried with some apparent success in angioneurotic edema. It is used as a local remedy in gynecologic affections to relieve hyperemia and pain.

DOSAGE: The application of pure ichthyol to the skin in somewhat irritating, but a solution of 25 per cent. strength is generally not irritating. In chronic rheumatism a 50 per cent. ointment has been used locally. In gynecology it is combined with glycerin 1:10. Internally it may be given in solution or in the form of pills. The dose is from 0.2 to 2 Cc. or from 3 to 30 minims.

INFUSA, INFUSIONS.—Infusions are aqueous preparations made by pouring hot or cold water over a vegetable drug and allowing the mixture to stand for a definite period and then straining.

For the preparation included in this list see:

INFUSUM DIGITALIS, under **Digitalis.**

Iodoformum (Iodof.), Iodoform, U. S. P.—Tri-iodomethane, CHI_3, usually prepared by the action of iodin on alcohol or acetone in the presence of an alkali or alkali carbonate.

PROPERTIES: Iodoform occurs as a fine, lemon-yellow powder or lustrous crystals having a peculiar, very penetrating and persistent odor, and an unpleasant, slightly sweetish and iodin-like taste. It is very slightly soluble in water (1:10,000), soluble in alcohol (1:60), *and very soluble* in ether (1:7.5). It is also somewhat soluble in *fixed oils.*

INCOMPATIBILITIES: Iodoform is incompatible with calomel, silver salts, chlorates and nitrites.

ACTION AND USES: Iodoform is a local anesthetic, antiseptic and stimulant. When absorbed through the skin or from denuded surfaces it produces intoxication, which is not evident until after the lapse of some time. When swallowed it is partly decomposed with the production of iodids, which produce their ordinary effects. Part of the drug is absorbed, however, in a form of combination not yet understood, and produces symptoms that are different from those ordinarily caused by iodin. Iodoform is slowly excreted, iodin compounds appearing in the urine for several days after a single dose.

The symptoms are restlessness, anesthesia, sometimes unconsciousness, occasional convulsions, hallucinations and delusions of persecution, rapid pulse and elevated temperature; in many cases collapse, coma and death may follow.

The physiologic actions of iodoform afford no rational basis for its internal use, but, like many other drugs, it was at one time used in tuberculosis. Externally it is used as an antiseptic and stimulant in surgical tuberculosis. Several odorless organic compounds of iodin have been devised as substitutes for iodoform, but they are uniformly less actively antiseptic.

DOSAGE: 0.25 Gm. or 4 grains. It is usually applied externally in the form of a dusting-powder, but may be used in the form of emulsion, as an ointment or as a surgical dressing in the form of gauze. For the relief of hemorrhoids it should be given in the form of suppositories.

Iodum, Iodin, U. S. P.—Contains not less than 99.5 per cent. of I.

PROPERTIES: Iodin is a heavy, bluish-black, dry and friable solid crystallizing in rhombic plates, having a metallic luster, a distinctive odor and a sharp and acrid taste. It is readily volatile. It is very slightly soluble in water (1:2,950), but soluble in alcohol (1:10). It is also soluble in solutions of iodids.

INCOMPATIBILITIES: Iodin is incompatible with alkalies and alkali carbonates, the alkaloids, with tannin and other vegetable astringents and with most volatile oils, particularly the terpene-containing oils.

ACTION AND USES: Cutaneous: Iodin irritates the skin, causing a sensation of heat and itching. In concentrated solutions it may cause blistering, or even corrosion, but it acts more slowly than many other irritants. It penetrates into the deeper layers of the skin and small quantities are absorbed.

Iodin is applied to the skin for the purpose of exciting congestion of the underlying tissues. This congestion is supposed to cause the absorption of exudates. The benefit is probably overrated. It is also used by surgeons for the disinfection of the skin, for which it is considered to be the most desirable agent. The application is made by painting

the tincture over the area to be disinfected. The skin must be dry; wet applications should not be used previously. It is also used in various skin diseases for the purpose of producing an acute inflammatory reaction in the skin, and to cause the destruction of bacteria. Its effect on bacteria below the epidermis is probably due to the inflammatory reaction which it excites rather than to any direct action on the bacteria. For the prevention of tetanus it is recommended to apply to the skin about the wound a 3 per cent. alcoholic solution of iodin and to the wound pieces of gauze soaked in the same solution.

INTERNAL.—Iodin is more irritating to mucous membranes than to the skin. It is seldom used internally because of the irritating action on the stomach and intestines. This irritation may be so great as to excite a suppurative gastritis. The irritating action on the intestines may cause diarrhea. Small quantities of iodin are converted in the intestines into iodids and absorbed in this form. In some cases there is formed, also, a protein compound of iodin. After absorption iodin acts like the iodids (see **Potassium Iodid**). In cases of iodism, produced by the use of elementary iodin, there is tachycardia and irritation of the nervous system, but not so much affection of the skin and respiratory tract as is seen after the administration of the iodids.

Iodin is rarely used internally; in treatment of obstinate vomiting the tincture has been recommended in doses of from 0.03 to 0.05 Cc. or from ½ to 1 minim combined with the same quantity of phenol, given in a little water.

LOCAL USES: In the diseases of the eye iodin is sometimes used as a caustic agent and germicide to corneal ulcers of the simple type. It should be applied by means of a pointed toothpick soaked in the solution and used very cautiously.

For the treatment of chronic granular pharyngitis, in acute follicular tonsillitis, and in cases of middle ear catarrh associated with granular pharyngitis, it may be applied mixed with glycerin and combined with other remedies. The following formulas may be used:

	Cc.	
℞ Tinct. iodi	3	♏ xlviii
Glycerini	30	ʒ j-♏

℞ Tinct. iodi
Tinct. ferri chlor.
Glycerini ää.....q. s.

In gynecology the tincture is often applied directly to the interior of the cervix and painted over the mucous membrane of the vagina. This application is especially recommended in acute gonorrheal endocervicitis. Solutions of iodin have been much used in surgery. The tincture is often injected into cysts to cause the adhesion of their walls. Such applications should be made with caution. It may be applied in a similar way to fistulous canals. A diluted solution is useful as a stimulant to ulcers.

TINCTURA IODI (TR. IODI), TINCTURE OF IODIN, U. S. P.—One hundred Cc. contain 7 Gm. iodin and 5 Gm. potassium iodid dissolved in distilled water (5) and mixed with alcohol. This preparation, since it contains potassium iodid, is quite dissimilar to that formerly official in the U. S. P. or the international standard preparation generally prescribed in Europe. The U. S. P. tincture of iodin has the advantage of being more stable so far as the iodin content is concerned and of being miscible with water.

DOSAGE: 0.1 Cc. or 1½ minims. (If iodin is mixed with milk, the greater part is regularly converted into iodid and protein compounds, and larger doses are therefore tolerated.)

Ipecacuanha (Ipecac.), Ipecac, U. S. P. (Ipecacuanhae Radix, P. I.).—The dried root of *Cephaelis Ipecacuanha,* commercially known, as Rio, Brazilian or Para ipecac, or of *C. acuminata,* commercially known as Cartagena ipecac.

When assayed according to the method in the U. S. P., it should contain not less than 1.75 per cent. of the ether-soluble ipecac alkaloids.

ACTION AND USES: When given by mouth in rather large doses, ipecac causes nausea and vomiting, partly through its local irritant action. It is, however, neither a very rapidly acting nor a trustworthy emetic. Its use as such is almost entirely confined to pediatric practice.

In smaller doses it is nauseant and is used to promote the secretions of the respiratory tract.

Still smaller doses may act as stomachics through mild irritation of the gastric mucosa. When combined with opium, in the form of Dover's powder, ipecac is a diaphoretic.

Both ipecac and one of its principal alkaloids, emetin, are specific against amebic dysentery. In the treatment of this disease large doses of ipecac are required and opium or some other depressant drug often has to be given to prevent the occurrence of vomiting. Emetin, in the form of the hydrochlorid can, however, be given hypodermically in doses which correspond to large amounts of the crude drug, without causing nausea or vomiting. It is probably this alkaloid alone to which the specific action of ipecac in amebic dysentery is due.

DOSAGE: The expectorant dose of ipecac is 0.06 Gm. or 1 grain. As an emetic 1 Gm. or 15 grains may be given. For use in dysentery it may be given in salol-coated pills. The coating should not be too thick, lest too large a dose of salol be given. Ipecac may also be given, suspended in mucilage of acacia, by a duodenal catheter. In dysentery an initial dose of 2 Gm. or 30 grains may be given and vomiting should be prevented by a previous hypodermic injection of morphin. See also emetin hydrochlorid.

FLUIDEXTRACTUM IPECACUANHAE (FLDEXT. IPECAC.), FLUIDEXTRACT OF IPECAC, U. S. P.—One hundred Cc. represent 100 Gm. ipecac in approximately 75 per cent. alcohol, and yields not less than 1.8 Gm. of the ether-soluble alkaloids of ipecac.

DOSAGE: As an emetic, 1 Cc. or 15 minims; as an expectorant, 0.05 Cc. or 1 minim.

SYRUPUS IPECACUANHAE (SYR. IPECAC.), SYRUP OF IPECAC, U. S. P.—One hundred Cc. represent 7 Cc. fluidextract of ipecac; it is approximately seven times the strength of the international standard syrup of ipecac.

DOSAGE: As an expectorant, 1 Cc. or 15 minims given every two or three hours; as an emetic, 15 Cc. or 4 fluidrams.

Jalapa (Jalap.), Jalap, U. S. P.—The dried tuberous root of *Exogonium Purga*. Frequently used in the form of powder. It yields not less than 7 per cent. of the total resins of jalap.

ACTION AND USES: Jalap is a powerful purgative, producing copious watery evacuations. It is used for the purpose of removing water from the tissues in the treatment of dropsy.

DOSAGE: 1 Gm. or 15 grains. It is best administered as:

PULVIS JALAPAE COMPOSITUS (PULV. JALAP. CO.), COMPOUND POWDER OF JALAP, U. S. P. (Pulvis Purgans).—A mixture of jalap (35 Gm.) and potassium bitartrate (65 Gm.).

DOSAGE: 2 Gm. or 30 grains.

LINIMENTA, LINIMENTS.—Liniments are liquid preparations intended for external application.

For preparations included in this list see:

LINIMENTUM AMMONIAE, under **Ammonia.**

LINIMENTUM CALCIS, under **Calx.**

LINIMENTUM CAMPHORAE, under **Camphora.**

LINIMENTUM CHLOROFORMI, under **Chloroformum.**

LINIMENTUM SAPONIS, under **Sapo.**

Linum, Linseed, U. S. P. (Flaxseed).—The ripe seed of *Linum usitatissimum*. Used extensively in the ground form for making cataplasms.

OLEUM LINI (OL. LINI), LINSEED OIL, U. S. P. (Oil of Flaxseed, Raw Linseed Oil).—A fixed oil, obtained from linseed. Linseed oil which has been "boiled" must not be used or dispensed.

PROPERTIES: Linseed oil occurs as a yellowish, oily liquid, having a peculiar odor and a bland taste. It is slightly soluble in absolute alcohol, but practically insoluble in water.

DOSAGE: 30 Cc. or 1 fluidounce.

ACTION AND USES: Linseed oil has the properties of other bland oils, but is seldom administered internally. For pharmaceutical purposes it is used in the making of lime liniment, and of soft soap.

LIQUORES, SOLUTIONS.—Pharmaceutically, solutions are aqueous liquid preparations in which one or more substances are completely dissolved.

For preparations included in this list see:

LIQUOR ACIDI ARSENOSI, under **Arseni Trioxidum.**

LIQUOR ALUMINI SUBACETATIS, under **Alumini Acetas.**

LIQUOR AMMONII ACETATIS, under **Ammonii Acetas.**

LIQUOR ARSENI ET HYDRARGYRI IODIDI, under **Arseni Trioxidum.**

LIQUOR CALCIS, under **Calx.**

LIQUOR CRESOLIS COMPOSITUS, under **Cresol.**

LIQUOR FORMALDEHYDI, under **Formaldehydum.**

LIQUOR HYDROGENII DIOXIDI, under **Hydrogenii Dioxidum.**

LIQUOR HYPOPHYSIS, under **Hypophysis Sicca.**

LIQUOR MAGNESII CITRATIS, under **Magnesii Citras.**

LIQUOR PLUMBI SUBACETATIS, under **Plumbi Acetas.**

LIQUOR POTASSII ARSENITIS, under **Arseni Trioxidum.**

LIQUOR POTASSII HYDROXIDI, under **Potassii Hydroxidum.**

LIQUOR SODAE CHLORINATAE, under **Calx Chlorinata.**

LIQUOR SODII HYDROXIDI, under **Sodii Hydroxidum.**

LIQUOR ZINCI CHLORIDI, under **Zinci Chloridum.**

Lobelia (Lobel.), Lobelia, U. S. P. (Indian Tobacco).—The dried leaves and tops of *Lobelia inflata.* Occasionally administered in the form of powder.

ACTION AND USES: Lobelia acts similarly to nicotin. Small doses stimulate, and large doses paralyze, the respiratory center. The vagus endings in the bronchial muscles are also depressed and the bronchi are relaxed. Small doses taken continuously cause a persistent quickening of the pulse; moderate doses produce nausea and large doses produce vomiting with marked and dangerous collapse.

Lobelia is no longer used as an emetic. As an expectorant it may be employed to increase bronchial secretion, but it must be used with caution. It is chiefly used for the treatment of bronchial asthma, in which it often renders distinct service. It should never be employed in asthma due to or associated with heart disease.

DOSAGE: 0.15 Gm. or 2½ grains.

TINCTURA LOBELIAE (TR. LOBEL.), TINCTURE OF LOBELIA, U. S. P. (Lobeliae Tinctura, P. I.).—One hundred Cc. *represent* 10 Gm. lobelia in diluted alcohol.

DOSAGE: From 0.5 Cc. to 1.5 Cc. or from 10 to 20 minims. Ten minims may be given every fifteen minutes until distinct nausea is felt or relief is obtained.

Magnesii Carbonas (Mag. Carb.), Magnesium Carbonate, U. S. P.—A mixture of hydrated magnesium carbonate and magnesium hydroxid, corresponding to not less than 39.2 per cent. of MgO.

PROPERTIES: Magnesium carbonate occurs as light, white, friable masses, or a bulky, white powder, without odor, and having a slightly earthy taste. It is practically insoluble in water and in alcohol, but soluble with effervescence in dilute acids.

INCOMPATIBILITIES: It is incompatible with acids, which form salts of magnesium.

ACTION AND USES: Magnesium carbonate when taken internally neutralizes the acids in the stomach. It may be used in cases of hyperacidity or acid gastritis, but it is sometimes objectionable on account of the carbon dioxid gas evolved. The salt formed is laxative. If magnesium carbonate passes the stomach without neutralization, it may escape solution in the intestines and not act as a laxative. Large doses sometimes produce an accumulation of the insoluble carbonate and may lead to intestinal obstruction. Magnesium carbonate is largely used as a dusting powder in intertrigo and in similar conditions, and as a cosmetic.

DOSAGE: 3 Gm. or 45 grains.

Magnesii Citras, Magnesium Citrate.—Used in medicine as:

LIQUOR MAGNESII CITRATIS (LIQ. MAG. CIT.), SOLUTION OF MAGNESIUM CITRATE, U. S. P.—A solution containing 10 per cent. of a mixture of neutral and acid magnesium citrate corresponding to not less than 1.5 per cent. of MgO.

The materials for making 360 Cc. or 12 ounces of the preparation are placed in a strong bottle, potassium bicarbonate being added last, and the bottle properly corked.

ACTION AND USES: Solution of magnesium citrate is given as a laxative.

DOSAGE: The average dose is one bottle containing 360 Cc. or 12 fluidounces, often given in divided doses.

Magnesii Oxidum (Mag. Oxid.), Magnesium Oxid, U. S. P. (Magnesia, Calcined Magnesia, Light Magnesia).—Contains, after ignition, not less than 96 per cent. of MgO.

PROPERTIES: Magnesium oxid is a white, very bulky and very fine powder, without odor, and having an earthy but not a saline taste. It is almost insoluble in water and alcohol, but dissolves very readily in acids, forming salts of magnesium.

ACTION AND USES: Magnesium oxid is used mostly as an antacid to neutralize excessive acidity in the gastric juice. *It is especially* suitable for cases of hyperacidity accompanied by constipation. It is preferable in most cases to the

carbonates or bicarbonates because it yields no gas on being neutralized. It is sometimes given in diarrhea with excessive acidity in children. It is an efficient antidote to the corrosive acids.

DOSAGE: From 0.6 to 3 Gm. or from 10 to 45 grains; 2.5 Gm. or 40 grains are equivalent to the average laxative dose of magnesium sulphate (15 Gm. or 240 grains).

Magnesii Sulphas (Mag. Sulph.), Magnesium Sulphate, U. S. P. (Epsom Salt).—Contains not less than 99.5 per cent. of $MgSO_4+7H_2O$.

PROPERTIES: Magnesium sulphate occurs as small, colorless prismatic needles or rhombic prisms, without odor, and having a cooling, saline and bitter taste. It is freely soluble in water (1: 1), but practically insoluble in alcohol.

ACTION AND USES: Magnesium sulphate is one of the most active of the saline cathartics. When injected intravenously or intramuscularly it depresses the nervous and muscular structures, but the absorption from the alimentary canal is too slight to produce these effects. It has been injected for the purpose of producing spinal anesthesia, but its action is too uncertain and dangerous for use in man. It has been used by injections in the subarachnoid space for the relief of tetanus. It causes death through respiratory failure. The antidote is calcium chlorid. One should be prepared to administer a solution of calcium chlorid intravenously or subcutaneously in case signs of respiratory failure appear.

Concentrated solutions of magnesium sulphate have been widely used as local applications in various inflammations, such as sprains, burns, erysipelas and the like, with asserted beneficial results.

DOSAGE: 15 Gm. or 4 drachms. Magnesium sulphate may be dissolved so that 2 Cc. of the solution contains 1 Gm. of the salt, and of this solution 5 Cc., properly diluted, are given hourly until a laxative action is secured.

MASSAE, MASSES.—Masses are soft solid preparations of such consistency that they can be made into pills readily.

For preparations included in this list see:

MASSA FERRI CARBONATIS, under **Ferri Carbonas.**

MASSA HYDRARGYRI, under **Hydrargyrum.**

MELLITA, HONEYS.—Honeys are sweet liquids having honey as a base; they formerly were much used as vehicles.

Mentha Piperita (Menth. Pip.), Peppermint, U. S. P.—The dried leaves and flowering tops of *Mentha piperita.*

OLEUM MENTHAE PIPERITAE (OL. MENTH. PIP.), OIL OF PEPPERMINT, U. S. P.—A volatile oil distilled from the flowering plant of *Mentha piperita.*

PROPERTIES: Oil of peppermint occurs as a colorless liquid, with the characteristic peppermint odor and a strongly aromatic, pungent taste, followed by a sensation of cold when air is drawn into the mouth.

ACTION AND USES: Oil of peppermint is used as an aromatic stimulant and carminative.

DOSAGE: 0.2 Cc. or 3 minims.

SPIRITUS MENTHAE PIPERITAE (SP. MENTH. PIP.), SPIRIT OF PEPPERMINT, U. S. P. (Essence of Peppermint).—One hundred Cc. contain 10 Cc. oil of peppermint in alcohol, colored with the chlorophyl extracted from peppermint. ACTION AND USES: See the oil.

DOSAGE: 2 Cc. or 30 minims.

AQUA MENTHAE PIPERITAE (AQ. MENTH. PIP.), PEPPERMINT WATER, U. S. P.—A saturated solution of oil of peppermint in distilled water.

ACTION AND USES: Peppermint water is frequently used as a vehicle or flavoring.

DOSAGE: 15 Cc. or 4 fluidrams.

Menthol, Menthol, U. S. P.—A secondary alcohol, $C_{10}H_{19}OH$, obtained from oil of peppermint or other mint oils.

PROPERTIES: Menthol occurs as colorless, acicular or prismatic crystals, having a strong and pure odor of peppermint and a warm, aromatic taste, followed by a sensation of cold when air is drawn into the mouth. It is only slightly soluble in water, but freely soluble in alcohol, ether, liquid petrolatum, etc.

ACTION AND USES: Menthol has been used internally for the relief of gastric pain. Externally, it is applied on the skin as an anesthetic and cooling application. It is frequently used in the solid form known as menthol pencils. In this form it is rubbed over the painful part in neuralgia or headache.

It may also be applied in solution or ointment for the relief of itching, in a strength of from 1 to 2 per cent. It is used, dissolved in liquid petrolatum, as an application to inflamed mucous membranes, especially in the nose and throat. For this purpose a strength of 1 per cent. is suitable.

DOSAGE: 0.06 Gm. or 1 grain.

Methylis Salicylas (Methyl. Salicyl.), Methyl Salicylate, U. S. P. (Oleum Gaultheriae, U. S. P. VIII, Oil of Wintergreen, Oleum Betulae, U. S. P. VIII, Oil of Sweet Birch, Oil of Teaberry).—An ester, $CH_3C_7H_5O_3$, occurring in oil of birch and in oil of wintergreen, and also produced synthetically. The label should indicate *the source of the* product.

PROPERTIES: Pure methyl salicylate is a colorless liquid, having a characteristic, strongly aromatic, wintergreen odor and a sweetish, warm and aromatic taste. It is nearly insoluble in water, but miscible in all proportions with alcohol. The oils obtained from natural sources

frequently have a pinkish tint, because of the contamination with traces of iron, but in general have the same properties as methyl salicylate, to the requirements and tests for which they conform.

ACTION AND USES: Methyl salicylate and the oils containing it are antiseptic, and when absorbed by the skin or taken internally have the actions of salicylic acid or the salicylates (see **Sodium Salicylate**). When rubbed on the skin it is rapidly absorbed. It is frequently applied for the relief of pain in local rheumatic swellings or over inflamed nerves.

DOSAGE: 1 Cc. or 15 minims. When given internally this substance is preferably administered in the form of capsules, care being taken that the stomach is not empty and that plenty of water is taken. Locally, the oil may be applied pure or added to liniments.

MISTURAE, MIXTURES.—Mixtures are liquid preparations containing insoluble or partly soluble medicinal substances suspended in them.

Morphina, Morphin, U. S. P.—An alkaloid, $C_{17}H_{19}O_3N + H_2O$, obtained from opium; the chief therapeutic constituent of the drug.

PROPERTIES: Morphin occurs as colorless or white crystals or a crystalline powder, odorless and having a bitter taste. It is very slightly soluble in water (1: 3,340), and slightly soluble in alcoho (1: 210).

INCOMPATIBILITIES: Morphin solutions are incompatible with alkalies, tannic acid, iodids and other precipitants of alkaloids.

ACTION AND USES: There are essentially three actions of morphin: a specific central analgetic action, a depressant action on the entire central nervous system, of a descending type, and a constipating effect resulting from a combination of central and local actions.

Morphin is practically devoid of local action, except on the gastro-intestinal tract. This local action is the subject of much debate, but it seems certain that it plays a part in the causation of the constipation which results from the administration of the drug. The drug has no local analgetic action and its use locally for the relief of pain is irrational.

The systemic actions of morphin are greatly dependent on the dose used. The smallest doses producing therapeutic effects result in the relief of pain; somewhat larger doses cause definite cerebral depression leading to more or less profound and prolonged sleep.

Some persons react peculiarly to morphin, showing one or more of the following symptoms: Cerebral excitation is, *perhaps, more* common in women than in men, but it is *usually mild* and of short duration, soon giving place to the *depressant* action of the drug. Nausea and even vomiting

not infrequently result from the systemic administration of a small dose. In some persons nausea is a very pronounced after-effect of the drug, lasting, at times, for hours.

The drug probably exerts a decided effect on the heart, through the vagus mechanism, chiefly influencing the rhythm, which may become irregular. The rate may be slowed considerably after large doses, but morphin does not endanger life through its cardiac action.

Morphin causes a marked constriction of the pupil when given in moderate doses, and this phenomenon is often used as a gage for the cessation of its administration in cases in which large doses are necessary. It has no local miotic action when dropped into the eyes.

The respiratory center is depressed by relatively small doses of morphin—such as are too small to be hypnotic. Use is made of this action in the treatment of persistent and troublesome cough, but it should be remembered that if the cough is "productive," the depression of the cough reflex may lead to a dangerous retention of the secretions of the inflamed mucosa.

Morphin is used chiefly as an analgetic in conditions of severe acute pain, and its use should be very guarded on account of the great danger of the formation of the morphin habit. In surgical conditions in which the alleviation of severe pain may obscure the course of the disease and lead to the unwarranted postponement of an operation, morphin should not be used, or only in very small doses and with circumspection. In chronic conditions associated with pain morphin should not be used, as the formation of the habit is almost certain to result from its prolonged administration. Exceptions to this generalization are to be found in such conditions as inoperable cancer, etc., in which the condition is hopeless and at the same time the cause of much suffering. Morphin should not be used for the relief of pain in persons of a neurotic or hysteric temperament, unless absolutely unavoidable. In general, it may be said that morphin should not be used for the relief of pain when any satisfactory relief can be obtained by the use of other drugs. Morphin, in moderate doses, is very useful in pain of cardiac origin. Morphin may be used to relieve the attacks of asthma and to lessen dyspnea from other causes, but caution should be exercised that the slowing of the respiration does not embarrass the heart. It should be used cautiously in the pain and dyspnea of uremia, as it interferes with elimination by the intestines.

Since the introduction of the coal-tar hypnotics and those of the chloral group, the use of morphin as a pure hypnotic has become exceptional.

Morphin, in the form of opium, is often given as a diaphoretic, the well-known Dover's powder being the preparation commonly used.

Habituation to morphin is readily established, and this *habit is one of the most difficult to break. The indiscriminate use of morphin* and preparations containing it by

physicians is a common cause of the habit, and too great discrimination in its use can hardly be urged.

Overdoses of morphin lead to intoxication which may result fatally. The symptoms begin with the usual depression which deepens into sleep. The pupils become extremely constricted. Respiration becomes slow; the sleep deepens into coma from which the patient can be aroused with difficulty at first; later he cannot be aroused at all, and the respiration sinks to as low as three or four per minute. The heart is somewhat weakened and its rate is slowed. Death results from respiratory failure.

The treatment of morphin poisoning is not germane to this work, but its proper execution will often save a patient who is deemed hopeless.

Morphin is excreted largely through the alimentary tract, including the stomach. Some of the morphin thus excreted may be reabsorbed into the circulation; hence, in cases of poisoning, the use of frequent gastric lavage with permanganate of potassium, to destroy the morphin, is an important measure. Even after the hypodermic administration of the drug it is excreted by way of the gastro-intestinal tract.

Morphin is also used to lessen secretion and check peristalsis in diarrhea. For this purpose opium appears to be more efficient than morphin.

In the administration of morphin the danger of forming a habit should never be forgotten.

DOSAGE: 0.008 Gm. or ⅛ grain. Smaller doses, from 0.005 to 0.006 Gm., or 1/12 to 1/10 grain, are often sufficient. Less than 0.06 Gm. or 1 grain is seldom fatal for an adult.

Morphinae Hydrochloridum (Morph. Hydrochl.), Morphin Hydrochlorid, U. S. P. (Morphin Chlorid).—The hydrochlorid, $C_{17}H_{19}O_3N.HCl+3H_2O$, of the alkaloid morphin.

PROPERTIES: Morphin hydrochlorid occurs as white crystals or as a crystalline powder, odorless and having a bitter taste. It is soluble in water (1: 17.5), and in alcohol (1: 52).

DOSAGE: 0.008 Gm. or ⅛ grain.

Morphinae Sulphas (Morph. Sulph.), Morphin Sulphate, U. S. P.—The sulphate, $(C_{17}H_{19}O_3N)_2H_2SO_4+5H_2O$, of the alkaloid morphin.

PROPERTIES: Morphin sulphate occurs as white, feathery crystals or in cubical masses, odorless, permanent in the air and having a bitter taste. It is soluble in water (1: 15.5), but only slightly soluble in alcohol (1: 565).

DOSAGE: 0.008 Gm. or ⅛ grain.

Morrhuae Oleum (Ol. Morrh.), Cod-Liver Oil, U. S. P. (Oleum Jecoris Aselli).—A fixed oil obtained from the fresh livers of *Gadus morrhua.*

PROPERTIES: Cod-liver oil occurs as a pale yellow, thin, oily liquid having a peculiar, slightly fishy, but not rancid odor, and a bland, fishy taste.

ACTION AND USES: Cod-liver oil is generally considered to be tonic and nutrient, but its value probably depends entirely on its nutritive property. It is preferably administered in the form of a recently prepared emulsion, though many persons are able to take the oil as such. Alcoholic preparations of the so-called active principles of cod-liver oil have no demonstrable therapeutic action.

DOSAGE: 4 to 30 Cc., or 1 fluidram to 1 fluidounce.

MUCILAGINES, MUCILAGES.—Mucilages are aqueous solutions of gums or the mucilaginous principles of vegetable substances.

For the preparation included in this list see:

MUCILAGO ACACIAE, under **Acacia.**

Myrrha (Myrrh.), Myrrh, U. S. P. (Gum Myrrh).—A gum resin obtained from one or more species of *Commiphora.* Used occasionally in the form of powder, and also used as a carminative, in connection with aloes, in the form of pills.

ACTION AND USES: Myrrh is astringent and carminative. It is used largely as an ingredient in mouth washes and gargles for relaxed throat and spongy gums.

DOSAGE: 0.5 Gm. or 8 grains.

TINCTURA MYRRHAE (TR. MYRRH.), TINCTURE OF MYRRH, U. S. P.—One hundred Cc. represent 20 Gm. myrrh in alcohol.

DOSAGE: 1 Cc. or 15 minims. For use in the mouth dilute with an equal volume of water.

Novatophan.—See under **Acidum Phenylcinchoninicum.**

Novocain, Novocain Hydrochlorid, N. N. R.—Novocain as ordinarily marketed is the monohydrochlorid of para-aminobenzoyldiethyl - amino - ethanol, $CH_2(C_6H_4.NH_2.CO O).CH_2N(C_2H_5)_2$.

PROPERTIES: Novocain occurs as fine colorless needles. It is freely soluble in water (1: 1) and soluble in alcohol (1: 30).

ACTION AND USES: Novocain is a local anesthetic similar in action to cocain, but it is less toxic than cocain and other cocain substitutes. When injected subcutaneously it is said to exert a prompt and powerful anesthetic action, but the effect is not sustained. This may be remedied by the simultaneous injection of epinephrin. Novocain is not irritant.

DOSAGE: For infiltration anesthesia, solutions of 0.25 Gm. (4 grains) novocain in 100 or 50 Gm. (3.2 or 1.6 ounces) physiologic salt solution, with 5 or 10 drops of epinephrin *solution (1:1,000)*: for instillations and injections, *solutions of 0.1 Gm.* (1½ grains) novocain in 10 or 5 Gm.

(150 or 75 grains) salt solution, with or without 10 drops of epinephrin solution (1:1,000). In ophthalmology, 1 to 5 to 10 per cent. solution, in rhinolaryngology 5 to 20 per cent. solutions are recommended, with the addition of 6 to 8 drops of epinephrin solution (1:1,000) to each 10 Cc. (160 minims).

Nux Vomica (Nux Vom.), Nux Vomica, U. S. P. (Strychni Semen, P. I.).—The dried, ripe seed of *Strychnos Nux-vomica*, yielding, when assayed by the process given in the U. S. P., not less than 2.5 per cent. of the alkaloids of nux vomica.

ACTION AND USES: The pharmacologic action of nux vomica is essentially the same as that of the strychnin which it contains. The preparations of nux vomica are used as stomachic tonics, and occasionally as respiratory and nerve stimulants. For the latter purpose the salts of strychnin are generally preferred. (See **Strychnin Sulphate.**)

EXTRACTUM NUCIS VOMICAE (EXT. NUC. VOM.), EXTRACT OF NUX VOMICA, U. S. P. (Powdered Extract of Nux Vomica, Nucis Vomicae Extractum, P. I.).—A powdered extract of nux vomica made by extracting the drug with a mixture of alcohol and water, yielding, when assayed by the process given in the U. S. P., from 15.2 to 16.8 per cent. of the alkaloids of nux vomica.

DOSAGE: 0.015 Gm. or ¼ grain, preferably given in the form of pills; 0.020 Gm. or ⅓ grain contains about 0.001 Gm. or 1/60 grain of strychnin.

TINCTURA NUCIS VOMICAE (TR. NUC. VOM.), TINCTURE OF NUX VOMICA, U. S. P.—One hundred Cc. represent 10 Gm. of nux vomica in a mixture of alcohol and water; it should assay about 0.25 Gm. of total alkaloids of nux vomica in 100 Cc.

DOSAGE: 0.5 Cc. or 8 minims.

When the tincture is used as an appetizer, its effect depends largely on the psychic stimulation produced by the bitter taste, and the dose may vary from 0.05 Cc. to 0.6 Cc. or from 1 to 10 minims. If it is desired to obtain the effect of strychnin, it is to be remembered that 0.6 Cc. or 10 minims contain approximately 0.6 mg. or 1/100 grain of strychnin.

OLEATA, OLEATES.—The official oleates are combinations of alkaloids or metallic oxids with oleic acid.

OLEA PINGUA, FIXED OILS.—Fixed oils and fats are neutral esters of vegetable or animal derivation being compounds of acids (chiefly oleic, palmitic and stearic), with glycerol.

For fixed oils included in this list see:

OLEUM LINI, under **Linum.**

OLEUM MORRHUAE, under **Morrhuae Oleum.**

OLEUM RICINI, under **Ricini Oleum.**

OLEUM THEOBROMATIS, under **Theobromatis Oleum.**

OLEUM TIGLII, under **Tiglii Oleum.**

OLEA VOLATILIA, VOLATILE OR ESSENTIAL OILS.—Volatile or essential oils are liquids derived from plants and may contain or consist of neutral principles, aldehyds, ketones, phenols, esters or compound ethers.

For volatile oils included in this list see:

OLEUM CARYOPHYLLI, under **Caryophyllus.**

OLEUM CHENOPODII, under **Chenopodium.**

OLEUM CASSIAE, under **Cinnamomum.**

OLEUM EUCALYPTI, under **Eucalyptus.**

OLEUM MENTHAE PIPERITAE, under **Mentha Piperita.**

OLEUM SANTALI, under **Santali Oleum.**

OLEUM SINAPIS VOLATILE, under **Sinapis.**

OLEUM TEREBINTHINAE, under **Terebinthina.**

OLEORESINAE, OLEORESINS.—Oleoresins are thick liquid preparations consisting of volatile oils and resins extracted from vegetable substances by ether, acetone or alcohol.

For the preparation included in this list see:

OLEORESINA ASPIDII, under **Aspidium.**

Opium, Opium, U. S. P.—The air-dried milky exudation obtained by incising the unripe capsules of *Papaver somniferum* and its variety *album.*

ACTION AND USES: The action of opium closely resembles that of morphin. Opium, however, is absorbed more slowly and is more constipating and hence is preferred in the treatment of the gastro-intestinal tract, especially for the purpose of checking diarrhea.

OPII PULVIS (OPII PULV.), POWDERED OPIUM, U. S. P. (Opii Pulvis, P. I.).—Yielding, when assayed by the official process, not less than 10 per cent. of anhydrous morphin.

DOSAGE: 0.06 Gm. or 1 grain, containing about 0.008 Gm. or about ⅛ grain of morphin. Suppositories of opium have no advantage on account of local action.

EXTRACTUM OPII (EXT. OPII), EXTRACT OF OPIUM, U. S. P. (Powdered Extract of Opium, Opii Extractum, P. I.).—Yielding, when assayed by the official process, about 20 per cent. of anhydrous morphin.

DOSAGE: 0.03 Gm. or ½ grain.

TINCTURA OPII (TR. OPII), TINCTURE OF OPIUM, U. S. P. (Laudanum, Opii Tinctura, P. I.).—A solution of the soluble constituents of opium in diluted alcohol. One hundred Cc. contain about 1 Gm. of anhydrous morphin.

DOSAGE: 0.5 Cc. or 8 minims.

TINCTURA OPII DEODORATI (TR. OPII DEOD.), TINCTURE OF DEODORIZED OPIUM, U. S. P.—Essentially a tincture of opium that has been deodorized by means of purified petroleum benzin.

DOSAGE: 0.5 Cc. or 8 minims.

TINCTURA OPII CAMPHORATA (TR. OPII CAMPH.), CAMPHORATED TINCTURE OF OPIUM, U. S. P. (Paregoric, Opii Tinctura Benzoica, P. I.).—Each 100 Cc. represent powdered opium (0.4 Gm.), benzoic acid (0.4 Gm.), camphor (0.4 Gm.), oil of anise (0.4 Cc.), glycerol (4 Cc.), and diluted alcohol (to make 100 Cc.).

DOSAGE: 4 Cc. or 1 fluidram, containing 0.0016 Gm. or 1/40 grain of morphin.

PULVIS IPECACUANHAE ET OPII (PULV. IPECAC. ET OPII), POWDER OF IPECAC AND OPIUM, U. S. P. (Compound Powder of Ipecac, Dover's Powder, Opii et Ipecacuanhae Pulvis Compositus, P. I.).—A mixture of ipecac (10 Gm.), powdered opium (10 Gm.) and sugar of milk (80 Gm.).

ACTION AND USES: Dover's powder is used chiefly for its diaphoretic effect.

DOSAGE: 0.5 Gm. or 8 grains, containing 0.005 Gm. or 1/12 grain of morphin.

Oxygenium (Oxygen.), Oxygen, U. S. P.—Gaseous oxygen, O_2, in a compressed state. Contains not less than 95 per cent. of O.

PROPERTIES: Oxygen occurs as a colorless, odorless and tasteless gas, slightly soluble in water and neutral to ordinary indicators. This gas is not inflammable, but supports combustion much more vigorously than does air.

ACTION AND USES: Compressed oxygen is administered for the purpose of relieving difficult respiration in cases of mechanical hindrance to the ingress of air to the lungs; also in the treatment of carbon monoxid poisoning. It is also mixed with nitrogen monoxid when this gas is used as an anesthetic.

Pancreatinum (Pancreat.), Pancreatin, U. S. P.—A mixture of the enzymes naturally existing in the pancreas of warm-blooded animals, usually obtained from the fresh pancreas of the hog, *Sus scrofa* or the ox, *Bos taurus*. Samples on the market usually contain much extraneous matter.

PROPERTIES: Pancreatin occurs as a cream-colored, amorphous powder, having a faint, peculiar, not unpleasant odor, and a somewhat meat-like taste. It is partially soluble in water and should not contain more than 10 per cent. of insoluble matter. It is practically insoluble in alcohol. Commercial samples commonly contain no steapsin, and other ferments may be present in traces only.

ACTION AND USES: Pancreatin is used chiefly for the predigestion of protein and starchy foods. Since it is destroyed by the action of the gastric juice, its use for the digestion of food in the stomach is illogical, if the stomach contains any acid. In cases of achylia gastrica in which no hydrochloric acid is secreted, it may be given to secure the digestion of the food in the stomach. In such cases it is well to administer a small amount of an alkali, such as sodium bicarbonate, in order to neutralize any acidity that may be present. In view of the poor quality of pancreatin on the market its use is not to be recommended.

The attempt is sometimes made to further the digestion of protein in the intestines by the administration of pancreatin in pills or capsules coated so as to prevent the action of the gastric juice. The drug may be used in this manner in cases in which it is believed that the secretion of the pancreas is lacking or deficient, but this method is not usually very successful.

DOSAGE: 0.5 Gm. or 8 grains. Pancreatin may be administered internally in the form of salol-coated pills or in gelatin capsules that have been treated with formaldehyd.

Paraffinum (Paraff.), Paraffin, U. S. P.—A purified mixture of solid hydrocarbons, obtained by chilling and pressing the higher distillates from petroleum and purifying the solid press-cake so obtained.

PROPERTIES: Paraffin is a colorless or white translucent mass, without odor or taste and slightly greasy to the touch. It is practically insoluble in water or in alcohol.

ACTION AND USES: Paraffin is used in surgery for prosthetic purposes. It is injected into the tissue to fill the place of parts which have been destroyed by trauma or pathologic processes. When used for this purpose, the melting-point of the product is important. A preparation melting at from 41 to 45 C. (105.8 to 113 F.) is most suitable. Its use for this purpose is not without danger.

Paraldehydum (Paraldehyd.), Paraldehyd, U. S. P.—$(CH_3.CHO)_3$. A polymer of acetaldehyd, $CH_3.CHO$.

PROPERTIES: Paraldehyd is a colorless, transparent liquid, having a strong characteristic odor, and producing first a burning and then a cooling taste. It is soluble in water (1: 8) and miscible in all proportions with alcohol.

ACTION AND USES: Paraldehyd is hypnotic and antispasmodic. It has no direct action on the circulation, except that it dilates the blood-vessels. It acts rapidly and produces a sleep which closely resembles natural sleep. It is very valuable when a rapid action is desired. The

disagreeable odor of paraldehyd, persisting in the breath of the patient, interferes with its use in many cases. It may cause a habit very similar to that induced by alcohol.

DOSAGE: 2 Cc. or 30 minims. Preferably administered with cracked ice or ice-water.

Pelletierinae Tannas (Pellet. Tann.), Pelletierin Tannate, U. S. P.—A mixture in varying proportions of the tannates of four alkaloids obtained from pomegranate bark.

PROPERTIES: Pelletierin tannate occurs as a light yellow, odorless, amorphous powder, having an astringent taste and a weak acid reaction. It is only slightly soluble in water (1: 240), but soluble in alcohol (1: 16).

ACTION AND USES: Pelletierin tannate is used as an anthelmintic and teniafuge, especially in cases of cestode infection.

DOSAGE: 0.25 Gm. or 4 grains. Preferably administered in the form of capsules. The alimentary canal should be emptied as completely as practicable by a mild purgative (castor oil or a saline), a light diet on the previous day and fasting on the morning on which the anthelmintic is given. This remedy should be followed in two hours by a purgative (castor oil). Not more than 0.3 Gm. or 5 grains of pelletierin tannate should be given, as even this amount has produced paralysis.

Pepsinum (Pepsin.), Pepsin, U. S. P.—A mixture containing a proteolytic ferment or enzyme obtained from the glandular layer of the fresh stomach of the hog, *Sus scrofa*.

PROPERTIES: Pepsin occurs as pale yellow, transparent or translucent scales or grains, or as a cream-colored, amorphous powder, free from any offensive odor and having a slightly acid or saline taste. It is soluble, or almost entirely soluble in water (1: 50), the solution having more or less opalescence; it is practically insoluble in alcohol.

ACTIONS AND USES: Pepsin acts only in an acid medium. It is useful to secure the digestion of protein food in the stomach. It is seldom indicated, because the gastric juice usually contains sufficient pepsin to perform gastric digestion. It may be given in conjunction with hydrochloric acid in those cases of acute dyspepsia in which there is an absence of free hydrochloric acid in the stomach contents. In chronic cases it should be given only when the acid and pepsin are both lacking. As a rule, even when acid is absent, the pepsin is still secreted and digestion will occur normally if hydrochloric acid is given without pepsin.

DOSAGE: 0.5 Gm. or 8 grains.

Petrolatum (Petrolat.), Petrolatum, U. S. P. (Petrolatum Ointment, Petroleum Jelly).—A purified mixture of hydrocarbons, obtained by distilling off the lighter and more volatile portions from petroleum, and purifying the residue.

PROPERTIES: Petrolatum occurs as an unctuous mass, of about the consistence of an ointment, varying in color from white to dark amber. The white variety is official as Petrolatum Album, or White Petrolatum, U. S. P.

ACTION AND USES: Petrolatum is used chiefly as a base for ointments. It is sometimes employed as a lubricant, for which purpose only a sterile product should be used.

Petrolatum Liquidum (Petrolat. Liq.), Liquid Petrolatum, U. S. P. (Liquid Paraffin, Mineral Oil).—A mixture of liquid hydrocarbons, obtained by distilling off most of the lighter and more volatile portions from petroleum, and purifying the liquid residue. The specific gravity ranges from 0.828 to 0.905. In the Pharmacopeia two varieties are separately described as:

HEAVY LIQUID PETROLATUM.—Viscosity not less than 3.1.

LIGHT LIQUID PETROLATUM.—Viscosity not more than 3. Vaporizes freely.

PROPERTIES: It occurs as a colorless or very slightly yellowish, oily, transparent liquid, without odor or taste, but giving off, when heated, a faint odor of petroleum. It is practically insoluble in water and only slightly more soluble in alcohol.

ACTION AND USES: Liquid petrolatum is used as a vehicle for medicinal agents for external application. It is also given internally, largely for its mechanical action as an emollient in constipation. It is not absorbed by the intestine and has no nutritive properties.

DOSAGE: 15 Cc. or 4 fluidrams.

Phenacetin.—See under **Acetphenetidinum.**

Phenol, Phenol, U. S. P. (Acidum Carbolicum, Carbolic Acid).—Hydroxybenzene, C_6H_5OH, obtained from coal-tar by fractional distillation and subsequent purification or made synthetically.

PROPERTIES: Phenol should contain not less than 97 per cent. of C_6H_5OH. It occurs as colorless, interlaced or separate, needle-shaped crystals, having a characteristic somewhat aromatic odor. When copiously diluted with water it has a sweetish taste, with a slightly burning aftertaste, and, when undiluted, cauterizes and whitens the skin and mucous membranes. Phenol is soluble in water (1:15) and miscible with alcohol in all proportions.

ACTION AND USES: Phenol is antiseptic and germicidal. A solution of 1:850 will prevent the multiplication of bacteria. A 1 per cent. solution will usually destroy non-sporulating bacteria in a few minutes at ordinary temperature, but a 5 per cent. solution fails to destroy anthrax spores after twenty-four hours' exposure.

Phenol is taken as the type or standard for comparing the activity of disinfectants. The phenol coefficient means the relative strength of a disinfectant, as compared with a solution of phenol acting on the same organism and for *the same length* of time. It should be remembered that *different micro-organisms* show wide differences in their *behavior toward* antiseptics.

Phenol is escharotic when applied to the skin, turning the skin and tissues white. If a finger or other extremity is surrounded with dressings wet even with a dilute solution of phenol, gangrene is liable to occur. Phenol acts as a local anesthetic. In consequence of this property it is employed to relieve itching. It may be used in the strength of 1 per cent. in solution or in ointment.

Internally, phenol has been used as an antiseptic in mouth washes, gargles and sprays. It was formerly employed as an antiseptic in fermentation in the stomach, but it should not be used for this purpose. It is sometimes given with success to check obstinate vomiting.

The injection of phenol into the rectum for the destruction of parasites is dangerous and has sometimes resulted fatally.

Superficial "burns" from the action of phenol should be treated by the application of alcohol, glycerin, ether or oils to remove the poison.

In phenol poisoning the stomach may be washed out by diluted alcohol, which should be completely removed by washing with water. If left in the stomach the alcohol may favor the absorption of phenol.

PHENOL LIQUEFACTUM (PHENOL. LIQ.), LIQUEFIED PHENOL, U. S. P. (Liquefied Carbolic Acid).—A liquid containing not less than 87 per cent., by weight, of C_6H_5OH.

PROPERTIES: Liquefied phenol is a colorless liquid which may develop a slight reddish tint on keeping. It has a characteristic, somewhat aromatic odor and the general chemical and physical characteristics of phenol.

DOSAGE: 0.05 Cc. or 1 minim.

Phenolphthaleinum (Phenolphthal.), Phenolphthalein, U. S. P.—A dibasic phenol derivative, dihydroxyphthalophenone $(C_6H_4OH)_2CO.C_6H_4CO$, produced by the interaction of phenol and phthalic anhydrid.

PROPERTIES: Phenolphthalein occurs as white, or faintly yellowish crystals or as an amorphous powder; nearly insoluble in water and freely soluble in alcohol (1: 13). Its solutions in acid liquids are colorless, but turn red when the liquid is made alkaline.

ACTION AND USES: Phenolphthalein acts as a purgative, but appears to possess no further physiologic action, except that it may cause some irritation of the rectum and lower bowel.

DOSAGE: The dosage must vary according to its effect, from 0.06 Gm. to 0.5 Gm., or from 1 to 8 grains. A case of mild poisoning is reported from taking 1 Gm. (15 grains).

Phenylis Salicylas (Phenyl. Salicyl.), Phenyl Salicylate, U. S. P. (Salol).—The phenylester, $C_6H_4(OH)COOC_6H_5$ 1:2, of salicylic acid.

PROPERTIES: Phenyl salicylate occurs as a white crystalline powder, having a faint aromatic odor and a slight but characteristic taste. It is *very slightly* soluble in water (1: 6,670) and freely soluble in *alcohol (1: 6)*.

ACTION AND USES: Phenyl salicylate is slightly antiseptic, but its antiseptic action is greatly increased when it is decomposed into its constituents, phenol and salicylic acid. It has very slight action in the mouth or stomach, but in the intestines it is decomposed into its constituents by the action of the fat-splitting ferment of the pancreas. After absorption, it produces the effect of salicylates, but if larger doses are given the phenyl may produce toxic effects. The urine is colored dark by the phenol excreted by the kidneys. If salol is to be used for its constitutional effects as a salicylate, it should always be remembered that about 40 per cent. of it consists of phenol.

Phenyl salicylate is sometimes used as an intestinal antiseptic. It is regarded by many as the best available drug for this purpose, but the opinion of many physicians is that little benefit is to be secured by the use of intestinal antiseptics.

Phenyl salicylate is used in diarrhea, enteritis and in the diseases believed to be due to intoxication by the products of intestinal putrefaction.

Salol is used in pharmacy for the purpose of coating enteric pills. It must be remembered that the coating of pills of moderate size entails the administration of a considerable dose of salol.

DOSAGE: From 0.2 to 0.5 Gm., or from 3 to 8 grains.

It is preferably administered in the form of powder and may be inclosed dry in capsules or cachets. Pills and compressed tablets are objectionable, because of the tendency of the substance to fuse into a hard insoluble mass.

Phosphorus (Phosphor.), Phosphorus, U. S. P.—Must be carefully preserved under water.

PROPERTIES: Phosphorus is a translucent, nearly colorless solid, of a waxy luster, having, at ordinary temperatures, about the consistency of beeswax. It has a distinctive and disagreeable odor and taste and should not be exposed to air. It is practically insoluble in water but slightly soluble in dehydrated alcohol (1: 350). It takes fire readily when exposed to the air. Great care should be used in handling elementary phosphorus. It should be carefully kept under water in a moderately cool place. It should be cut, or otherwise divided, under water. It may be secured in the form of small particles by cautiously melting under water and shaking until cool.

ACTION AND USES: In small quantities phosphorus stimulates the growth of bone. Somewhat larger doses produce a fatty degeneration of the various organs which is followed by a proliferation of the connective tissue.

In larger doses phosphorus is an irritant poison, causing nausea, vomiting and sometimes diarrhea. If absorbed, the poison produces a wide-spread, fatty degeneration of the organs, but frequently there are no symptoms for several days. This period may be followed by vomiting of blood, drowsiness, enlarged and painful liver and scanty urine. There are usually, in the latter stages, severe nervous symptoms, consisting of delirium, somnolence, coma and

occasionally convulsions. In workers in phosphorus, chronic poisoning is shown by a necrosis of the lower jaw. It was formerly believed that this necrosis was due to infection through carious teeth, which is favored by previous changes in the bone due to phosphorus, but it may be caused by phosphorus carried by the circulation.

Phosphorus was formerly used as a tonic or stimulant to the nervous system, but there is no evidence that it is of service in this way. Its use is gradually being abandoned. Its action on the blood is not regarded as justifying its use in anemia. The principal use of phosphorus is to further the deposition of calcium in growing bone, or in bones undergoing repair. For this purpose it may be given in rickets.

DOSAGE: 0.5 mg. or 1/120 grain. It may be administered either in the form of pills or as phosphorated oil (1:100).

Physostigma (Physostig.), Physostigma, U. S. P. (Calabar Bean, Ordeal Bean).—The dried ripe seeds of *Physostigma venenosum*. Used commonly in the form of salts of its principal alkaloid, physostigmin (eserin).

ACTION AND USES: Physostigmin stimulates the peripheral endings of the autonomic nerves and probably acts on the musculature to enhance its response to normal stimulation. It depresses the vagus. It also depresses the action of the spinal cord. It greatly increases intestinal peristalsis. It slows the pulse and after large doses increases the blood-pressure. It produces contraction of the pupil by local action. When instilled into one eye it causes contraction of the pupil on that side and not on the other.

Physostigma has been used for its depressing action on the spinal cord in tetanus, strychnin poisoning and other forms of convulsions. It should be used only as an adjuvant to other measures and not relied on as the sole remedy.

Physostigma is used to stimulate peristalsis in the paralytic form of colic and some cases of chronic constipation. It may be employed to overcome acute obstipation, provided there is no inflammation and no mechanical obstruction.

Physostigmin is used in treatment of eye diseases for the purpose of contracting the pupil and also to reduce intraocular tension. For the latter purpose it is serviceable in glaucoma. It is a useful remedy in peripheral ulcer of the cornea. It may be employed to hasten recovery from the effect of mydriatics, such as homatropin.

Physostigminae Salicylas (Physostig. Salicyl.), Physostigmin Salicylate, U. S. P. (Eserin Salicylate).—The salicylate $C_{15}H_{21}O_2N_3.C_7H_6O_3$, of an alkaloid obtained from *physostigma*.

PROPERTIES: Physostigmin salicylate occurs as colorless or faintly yellowish, odorless crystals. It acquires a red tint on exposure to light and air. It is soluble in water (1: 75) and in alcohol (1: 16).

DOSAGE: 0.001 Gm. or 1/60 grain.

It is used in the eye in solution (freshly prepared) of the strength of from 0.1 to 1 per cent., often in conjunction with cocain. The following mixture may be used:

	Gm. or C.c.	
℞ Cocainae hydrochlor.....	0|02	gr. ¼
Physostigminae sulph.....	0|01	gr. ⅛
Aquae dest.....	10|00	ʒ ij

For hastening recovery from a miotic a drop of 0.1 per cent. solution in castor oil may be employed.

Pilocarpinae Hydrochloridum (Pilocarpin. Hydrochl.), Pilocarpin Hydrochlorid, U. S. P. (Pilocarpin Chlorid).—The hydrochlorid, $C_{11}H_{16}O_2N_2.HCl$, of an alkaloid obtained from pilocarpus.

PROPERTIES: Pilocarpin hydrochlorid occurs as colorless or white translucent crystals, odorless and having a faintly bitter taste. It is very soluble in water (1: 0.3) and freely soluble in alcohol (1: 3).

DOSAGE: From 0.001 to 0.01 Gm. or from 1/60 to 1/6 grain.

Pilocarpinae Nitras (Pilocarpin. Nit.), Pilocarpin Nitrate, U. S. P.—The nitrate, $C_{11}H_{16}O_2N_2.HNO_3$, of an alkaloid obtained from pilocarpus.

PROPERTIES: This salt is less soluble in both water (1: 4) and alcohol (1: 75) than is the hydrochlorid and has no evident advantages over that salt.

DOSAGE: 0.01 Gm. or 1/6 grain. Smaller doses of 1 mg. or 1/60 grain are frequently preferable.

Pilocarpus (Pilocarp.), Pilocarpus, U. S. P. (Jaborandi).—The leaflets of *Pilocarpus Jaborandi,* sold as Pernambuco Jaborandi, or of *Pilocarpus microphyllus,* sold as Maranhum Jaborandi.—Used chiefly in the form of a salt of its principal alkaloid, pilocarpin.

ACTION AND USES: Pilocarpin stimulates the oculomotor and other autonomic nerves. It produces excessive secretion of the salivary, mucous and sweat glands. It stimulates the unstriated muscles of the body generally and the motor system of the intestines, and causes a partial spasm of the bronchial muscles. It causes a marked slowing of the pulse and a fall of blood-pressure due to the lessened rate of the heart, but the unimportant vagus stimulation is soon followed by depression with an accelerated pulse-rate.

It contracts the pupil and causes spasm of the muscles of accommodation by a peripheral action.

Pilocarpus is administered internally chiefly for its *diaphoretic effect. In this* action it is serviceable in certain *diseases of the skin.* Under its continuous use there may

be a stimulation of the growth of hair in favorable cases. In doses just short of producing free diaphoresis it is sometimes of great benefit to relieve itching in generalized acute eczema, urticaria, pruritus, etc.

In diseases of the eye, such as glaucoma, corneal ulcer, etc., pilocarpin is employed as a weak miotic.

PILULAE, PILLS.—Globular, oval or flattened bodies, of such size and consistency that they can be swallowed whole.

For the preparation included in this list see:

PILULAE FERRI CARBONATIS, under **Ferri Carbonas.**

Pix Liquida (Pix. Liq.), Tar, U. S. P. (Pine Tar).—A product obtained by the destructive distillation of the wood of *Pinus palustris.*

PROPERTIES: Tar occurs as a semiliquid, viscid, blackish-brown product having an empyreumatic odor and a sharp and empyreumatic taste. Tar is miscible with alcohol and fixed or volatile oils, but is only partially soluble in water.

ACTION AND USES: Tar is a mild irritant to the skin, and when taken internally stimulates the bronchial mucous membrane. It is employed in the form of syrup as a remedy for subacute bronchitis.

Externally it is employed as a mild stimulant application to the skin. It should be used as the first remedy in changing the treatment from sedative to stimulating applications. It is very useful as an antipruritic for the relief of itching in pruritus, eczema, etc.

DOSAGE: In beginning treatment with tar a dilute preparation should be used. The strength should be from 2 to 4 per cent., which may be tentatively increased. As an antipruritic in acute inflammatory conditions a strength of from 2 to 4 per cent. may be all that can well be used. In chronic cases it is used in the strength of from 6 to 20 per cent., and sometimes the pure tar is applied. For use as an antiseptic in skin affections the following formula may be used:

	Gm. or C.c.	
℞ Picis liquidae	2	ʒ ij
Potassii hydroxidi	1	ʒ j
Aquae	8	f ʒ j

This must be diluted for use.

The dose of the syrup is 4 Cc. or 1 fluidram.

UNGUENTUM PICIS LIQUIDAE (UNG. PIC. LIQ.), TAR OINTMENT, U. S. P.—A mixture of tar (50 Gm.) with yellow wax and lard to make 100 Gm.

This should usually be diluted from 10 to 20 times before application. In chronic conditions, scaly eruptions, psoriasis and ringworm it may be applied in full strength.

Plumbi Acetas (Plumb. Acet.), Lead Acetate, U. S. P. (Sugar of Lead).—Corresponds to not less than 99.5 per cent. of $Pb(C_2H_3O_2)_2+3H_2O$.

PROPERTIES: Lead acetate occurs as colorless or heavy white crystalline masses or granular crystals, having a faintly acetous odor and a sweetish, astringent, afterward metallic taste. It is freely soluble in water (1: 1.4) and soluble in alcohol (1: 38).

INCOMPATIBILITIES: Solutions of lead salts are incompatible with carbonates, hydroxids, iodids, chlorids and sulphates.

ACTION AND USES: The chief internal use of lead acetate is as an astringent in diarrhea. It is rarely used for this purpose for fear of lead poisoning. It may be combined with opium in the form of a lead and opium pill. A saturated alcoholic solution is used externally in ivy poisoning.

DOSAGE: 0.06 Gm. or 1 grain.

LIQUOR PLUMBI SUBACETATIS (LIQ. PLUMB. SUBACET.), SOLUTION OF LEAD SUBACETATE, U. S. P. (Goulard's Extract).—An aqueous solution containing lead subacetate corresponding to not less than 18 per cent. of Pb. It is made by boiling a mixture of lead acetate, lead oxid and distilled water for half an hour.

PROPERTIES: Solution of lead subacetate occurs as a clear, colorless liquid, odorless, having a sweetish, astringent taste and an alkaline reaction.

DOSAGE: This preparation should be diluted from fifteen to thirty times before application. It is employed as an astringent and antipruritic in inflammatory conditions of the skin and as an application to sprains and bruises. It should not be applied to denuded surfaces and should be used with caution on the face.

Podophyllum (Podoph.), Podophyllum, U. S. P. (Mandrake, May Apple Rhizome).—The dried rhizome of *Podophyllum peltatum.* Used in medicine chiefly in the form of:

RESINA PODOPHYLLI (RES. PODOPH.), RESIN OF PODOPHYLLUM, U. S. P. (Podophyllin).

PROPERTIES: Resin of podophyllum occurs as an amorphous powder, varying in color from light brown to pale greenish-yellow, turning darker when subjected to heat exceeding 25 C., or when exposed to light.

ACTION AND USES: Resin of podophyllum is very irritating to the mucous membrane, especially to that of the eyes. It has a slight, peculiar odor and a faintly bitter taste. It is very soluble in alcohol, but practically insoluble in water. It is used as a laxative and hydragogue cathartic, chiefly in the form of pills. It was formerly thought to exercise a special influence on the liver, but this idea has been abandoned. It is chiefly used in small doses for the treatment of chronic constipation.

DOSAGE: As a laxative in constipation small doses should be used, from 0.003 to 0.006 Gm. or from 1/20 to 1/10 grain, once or twice daily. For a cathartic effect it may be *given in* doses of from 0.008 to 0.03 Gm. or from 1/8 to 1/2 *grain.*

Potassii Acetas (Pot. Acet.), Potassium Acetate, U. S. P.—Contains not less than 99 per cent. of $KC_2H_3O_2$.

PROPERTIES: Potassium acetate occurs as a white powder or in crystalline masses, odorless, and having a saline taste; it is deliquescent on exposure to air. It is very soluble in water (1: 0.5), and is freely soluble in alcohol (1: 2.9).

ACTION AND USES: Potassium acetate is oxidized in the organism to potassium carbonate or bicarbonate. This tends to keep the blood alkaline, and the salts excreted by the kidney render the urine less acid and, after large doses, alkaline. It is an effective diuretic, increasing the amount of urine and the solids of the urine without irritation of the kidney; consequently it is preferable to other diuretics in the treatment of nephritis.

Potassium acetate is used as an alkaline diuretic in nephritis and to render the urine less irritant in cystitis. It is also employed in fevers and rheumatism.

Potassium salts are poisonous in excessive doses, but ordinarily the excretion is so efficient that there is no danger of toxic effects when therapeutic doses are administered by month. Toxic effects have been reported, however, after the administration of large doses in nephritis.

DOSAGE: 1 Gm. or 15 grains once in three hours, for a time. The continuation is regulated by the effect on the reaction of the urine.

Potassii Bicarbonas (Pot. Bicarb.) Potassium Bicarbonate, U. S. P.—Contains not less than 99 per cent. of $KHCO_3$.

PROPERTIES: Potassium bicarbonate occurs as colorless, transparent crystals, or a white, granular powder, odorless, having a saline and slightly alkaline taste; it is permanent in the air. It is freely soluble in water (1: 2.8), but is practically insoluble in alcohol.

INCOMPATIBILITIES: It is incompatible with acids.

ACTION AND USES: Potassium bicarbonate is sometimes used to neutralize the acidity of the stomach, but sodium bicarbonate is usually preferred. It may be employed for the extemporaneous preparations of potassium acetate or potassium citrate. If a solution of acetic or citric acid or lemon juice is neutralized with potassium bicarbonate, an equivalent dose of potassium acetate or citrate is formed.

Potassium bicarbonate tends to keep the blood alkaline and to lessen the acid of the urine. It may be given to secure the same alkaline effects for which the acetates or citrates are usually employed.

Externally, potassium bicarbonate may be employed for its alkaline effects, for the purpose of softening the epidermis.

DOSAGE: 1 Gm. or 15 grains.

Potassii Bitartras (Pot. Bitart.), Potassium Bitartrate, U. S. P. (Cream of Tartar).—Contains not less than 99.5 per cent. of $KHC_4H_4O_6$.

PROPERTIES: Potassium bitartrate occurs as a colorless or slightly opaque or white, somewhat gritty powder, odorless and having a pleasant acidulous taste. It is slightly soluble in water (1: 155) and nearly insoluble in alcohol (1: 8,820).

ACTION AND USES: Potassium bitartrate is diuretic and aperient. It is used chiefly in combination with jalap as a hydragogue cathartic. See Pulvis Jalapae Compositus under Jalap.

DOSAGE: 2 Gm. or 30 grains. Preferably administered in the form of a powder or as a "shake" mixture.

Potassii Bromidum (Pot. Brom.), Potassium Bromid, U. S. P. —Contains not less than 98.5 per cent. of KBr.

PROPERTIES: Potassium bromid occurs as colorless or white cubical crystals or granular powder, odorless and having a very strongly saline taste. It is freely soluble in water (1: 1.5), but only slightly soluble in alcohol (1: 250).

INCOMPATIBILITIES: It is incompatible with mineral acids or oxidizing agents and with salts of silver or lead.

ACTION AND USES: Potassium bromid is a nerve sedative. It diminishes reflex excitability and depresses the motor area of the cortex. In large doses it is depressant to the circulation. When continued long it disturbs the nutrition and may produce an irritation of the skin similar to that produced by the use of iodin.

Potassium bromid is used to relieve convulsions, either of cerebral or of spinal origin. For this reason it is given in epilepsy. Large doses are also given to relieve the spasms of tetanus.

Potassium bromid is also useful to quiet nervous excitability in neurasthenia and hysteria. It may be given as an adjunct to hypnotics, such as chloral. It is said to be of value for the prevention of seasickness.

The effects of potassium bromid are also produced by sodium bromid, and the latter salt is often preferred as being less irritating.

DOSAGE: 1 Gm. or 15 grains, preferably administered by itself in simple dilute solution or in milk.

The dose of potassium bromid may be increased to 5 Gm. or more if a powerful action is indicated. When the remedy is long continued it should be interrupted occasionally in order that no excessive accumulation in the system may occur.

Potassii Carbonas (Pot. Carb.), Potassium Carbonate, U. S. P. —Contains not less than 99 per cent. of K_2CO_3.

PROPERTIES: Potassium carbonate occurs as a white, granular powder, odorless and having a strongly alkaline taste. It is very soluble in water (1: 0.9), but practically insoluble in alcohol.

ACTION AND USES: Potassium carbonate is antacid, but because of its strongly alkaline and caustic properties is *rarely used internally* unless largely diluted. Solutions *are applied externally* to soften the epidermis.

Potassii Chloras (Pot. Chloras), Potassium Chlorate, U. S. P.—Contains not less than 99 per cent. of $KClO_3$.

PROPERTIES: Potassium chlorate is explosive when mixed with oxidizable matter, and caution should be observed in manipulating it. It occurs as colorless crystals or a white granular powder, odorless and having a cooling and characteristic taste. It is soluble in water (1: 11.5), but nearly insoluble in alcohol.

ACTION AND USES: Potassium chlorate is astringent. Large doses are actively poisonous, causing the formation of methemoglobin and the disintegration of the blood-corpuscles. Potassium chlorate is much used as a mouth wash in various forms of stomatitis. It is also employed as a gargle in the treatment of pharyngitis. Its value in these conditions, however, is uncertain. Its internal use is not to be recommended.

DOSAGE: A saturated solution may be used as a mouth wash or gargle.

Potassii Citras (Pot. Cit.), Potassium Citrate, U. S. P.—Contains not less than 99 per cent. of $K_3C_6H_5O_7.+H_2O$.

PROPERTIES: Potassium citrate occurs as transparent, prismatic crystals or a white granular powder, odorless, and having a cooling, saline taste. It is very soluble in water (1: 0.8), but very slightly soluble in alcohol.

ACTION AND USES: The actions of potassium citrate are much like those of the acetate, but it is less readily absorbed and consequently, in large doses, is more laxative.

DOSAGE: 1 Gm. or 15 grains.

POTASSII CITRAS EFFERVESCENS (POT. CIT. EFF.), EFFERVESCENT POTASSIUM CITRATE, U. S. P.—A mixture of potassium citrate (20 per cent.) with sodium bicarbonate, tartaric acid and citric acid.

DOSAGE: 4 Gm. or 1 dram.

Potassii et Sodii Tartras (Pot. et Sod. Tart.), Potassium and Sodium Tartrate, U. S. P. (Rochelle Salt).—Contains not less than 99 per cent. of $KNaC_4H_4O_6.4H_2O$.

PROPERTIES: Potassium and sodium tartrate occurs as colorless, transparent crystals or white powder, odorless and having a cooling saline taste. It is freely soluble in water (1: 0.9), but practically insoluble in alcohol.

ACTION AND USES: Potassium and sodium tartrate is used as a saline cathartic.

DOSAGE: 10 Gm. or 2½ drams.

PULVIS EFFERVESCENS COMPOSITUS (PULV. EFF. CO.), COMPOUND EFFERVESCING POWDER, U. S. P. (Seidlitz Powder).—A mixture of sodium bicarbonate (2.5 Gm.), potassium and sodium tartrate (7.5 Gm.) and tartaric acid (2.1 Gm.).

The sodium bicarbonate is mixed with the potassium and sodium tartrate and the mixture is wrapped in a blue paper. The tartaric acid is wrapped in a white paper.

DOSAGE: One set of two papers.

Potassii Hydroxidum (Pot. Hydrox.), Potassium Hydroxid, U. S. P. (Caustic Potash, Potassium Hydrate).—Should contain not less than 85 per cent. of KOH.

PROPERTIES: Potassium hydroxid occurs as dry, white or nearly white flakes, fused masses, or sticks, hard and brittle, showing a crystalline fracture, odorless and having, in dilute solutions, a very acrid and caustic taste. It rapidly destroys organic tissues, and great caution is necessary in handling. It is very soluble in water (1: 0.9) and freely soluble in alcohol (1: 3).

LIQUOR POTASSII HYDROXIDI (LIQ. POT. HYDROX.), SOLUTION OF POTASSIUM HYDROXID, U. S. P. (Liquor Potassae, Solution of Potassa).—One hundred Cc. contain about 5 Gm. of potassium hydroxid (KOH).

ACTION AND USES: Solution of potassium hydroxid is antacid, but, because of its irritant action, is seldom used internally, and when so employed should be largely diluted. Its action on the urine is similar to that of potassium carbonate, acetate of citrate. The carbonate and hydroxid are less satisfactory for the purpose than the acetate, and citrate, because of the possible deleterious effects of these alkalies in the stomach.

Externally it may be used to soften the epidermis for the removal of warts, corns, etc.

Potassii Iodidum (Pot. Iod.), Potassium Iodid, U. S. P.—Contains not less than 99 per cent. of KI.

PROPERTIES: Potassium iodid occurs as colorless or opaque white, cubical crystals, or a white granular powder, having a peculiar, faint, iodin-like odor, and a pungent, saline, afterward bitter taste. It is very soluble in water (1: 0.7) and soluble in alcohol (1: 22).

INCOMPATIBILITIES: Potassium iodid is incompatible with mineral acids and oxidizing agents and should not be prescribed in solution with alkaloids or alkaloid-containing drugs.

ACTION AND USES: Potassium iodid is slightly irritating to the gastro-intestinal canal, especially the stomach. After absorption ordinary doses produce no symptoms. It probably undergoes some decomposition with the liberation of iodin. In large or moderate doses, long continued, it frequently produces symptoms of iodism. These are due to irritation of the nasal passages, the bronchi and the skin. The irritation of the nose is shown by coryza, and by pain in the region of the frontal sinus.

There is considerable increase of the bronchial secretions.

On the skin it produces various eruptions, generally of a papular character, which rarely become pustular. Eruption and inflammation of the skin may sometimes be so extensive as to produce constitutional depression.

In iodism there are often symptoms resembling those of *exophthalmic goiter*—tachycardia, tremor, nervous irritability, *etc.*

Potassium iodid is regarded as an alterative. It is used as an expectorant to increase secretion in the bronchi. It is of value in subacute and chronic bronchitis. The most remarkable action of iodids is the absorption of gummatous exudates in tertiary syphilis. The iodid does not destroy the spirochetes, but possibly causes the formation of a proteolytic ferment that has a selective action on the round cells composing the gumma. By promoting the absorption of cellular exudates in the walls of the blood-vessels, it exerts a beneficial influence in many cases of arteriosclerosis. There is evidence that the forms of arterial disease rosis and aortitis. There is evidence that the forms of arterial disease which are improved by iodids are of syphilitic origin. A similar absorptive action, almost specific, is seen after administration of large doses of iodids in the granulomatous lesions of actinomycosis, sporotrichosis and blastomycosis.

Potassium iodid is used to promote the elimination of mercury and lead.

DOSAGE: The dosage varies in non-syphilitic cases from 0.3 to 2 Gm. or from 5 to 30 grains, but in cases of syphilis, especially in the tertiary form, much larger doses up to 5 Gm. and more may be necessary. It is often advisable to begin with 5 drops of a saturated solution three times a day after meals and increase by 1 drop per day added to each dose. It should not be given on an empty stomach, but with some food, preferably liquid, such as milk. On the occurrence of symptoms of iodism, such as coryza, papular or pustular eruptions, rapid pulse, etc., the remedy should be discontinued and resumed in smaller doses after the disappearance of toxic symptoms.

Potassii Permanganas (Pot. Permang.), Potassium Permanganate, U. S. P.—Contains not less than 99 per cent. of $KMnO_4$.

PROPERTIES: Potassium permanganate occurs as slender prisms, of a dark purple color, almost opaque by transmitted light and of a blue metallic luster by reflected light, odorless and having a taste which is at first sweet but afterward disagreeable and astringent. It is soluble in water (1: 13.5) and decomposes when brought into contact with alcohol.

ACTION AND USES: Potassium permanganate is deodorant and disinfectant. It has also been used, with doubtful efficiency, as an emmenagogue.

It has marked oxidizing properties and is used for this purpose in the treatment of certain forms of poisoning when the poison is still in the stomach. In morphin poisoning the stomach should be washed with a solution of potassium permanganate (1:2,000). The same treatment is useful in phosphorus poisoning. In cases of snake bite it may be given by hypodermic injections of a solution (1:500) in the vicinity of the wound.

Potassium permanganate has been used to disinfect the *hands in surgery.* The hand is dipped into the disinfectant

solution until it is a mahogany brown, and then dipped into a warm saturated solution of oxalic acid and rinsed in sterile water.

It is applied externally for excessive sweating of the feet.

DOSAGE: 0.06 Gm. or 1 grain, usually administered in the form of pills, being mixed with kaolin and massed with petrolatum. For application to the skin a solution of 1:500 may be used.

Protargol, Protargol, N. N. R. (Silver Proteinate).—A compound of albumin and silver containing 8.3 per cent. of silver in organic combination.

PROPERTIES: Protargol occurs as a light brown powder which is slowly but freely soluble in water (1:2). Protargol should be protected from the light and its solutions should be made as required. It is precipitated by cocain hydrochlorid, but this may be prevented by the addition of boric acid.

ACTION AND USES: Protargol is a non-irritant bactericide and antiseptic. It may be employed in chronic gonorrhea as a non-irritant substitute for silver nitrate, and in diseases of the mucous membranes of the eye, ear, nose and throat as an antiseptic and astringent. It is largely used in the treatment of conjunctivitis.

DOSAGE: It is used chiefly in the form of from 0.25 to 1 per cent. solution for instillations or injections and 1:1,000 to 1:2,000 solution as irrigations. Also used in the form of tampons and bougies. Solutions are preferably made by sprinkling the protargol over the surface of the required amount of cold water and setting aside until solution occurs.

Prunus Virginiana (Prun. Virg.), Wild Cherry, U. S. P. (Wild Black Cherry Bark).—The bark of *Prunus serotina,* used in medicine principally in the form of:

SYRUPUS PRUNI VIRGINIANAE (SYR. PRUN. VIRG.), SYRUP OF WILD CHERRY, U. S. P.—Represents an aqueous extract of 15 per cent. of wild cherry bark in the form of syrup.

INCOMPATIBILITIES: As it contains tannins it is incompatible with salts of iron.

ACTION AND USES: Syrup of wild cherry is largely used as a vehicle for cough medicines.

DOSAGE: 4 Cc. or 1 fluidram.

PULVERES, POWDERS.—Pharmaceutically, powders are combinations of several substances in powdered form or powdered vegetable drugs. The term "powders" is also applied to single dose quantities of a drug or mixture of drugs in powdered form wrapped separately in "powder *papers.*"

For the preparations included in this list see:

PULVIS EFFERVESCENS COMPOSITUS, under **Potassii et Sodii Tartras.**

PULVIS GLYCYRRHIZAE COMPOSITUS, under **Glycyrrhiza.**

PULVIS IPECACUANHAE ET OPII, under **Opium.**

PULVIS JALAPAE COMPOSITUS, under **Jalapa.**

PULVIS OPII, under **Opium.**

Quinina (Quin.), Quinin, U. S. P.—An alkaloid, $C_{20}H_{24}O_2N_2+3H_2O$, obtained from the bark of various species of Cinchona.

PROPERTIES: Quinin occurs as white, flaky, microcrystalline powder, odorless and having a bitter taste. It is very slightly soluble in water (1: 1,560), but very soluble in alcohol (1: 0.8).

ACTION AND USES: Quinin is antimalarial, antipyretic, ecbolic and is also used as a bitter tonic. Quinin is a protoplasmic poison, especially affecting the protozoa more than bacteria. It is somewhat irritant to the stomach and intestines and when absorbed it causes ringing in the ears, but in moderate doses produces no other marked effects in healthy persons. In patients with fever it is antipyretic. Its solutions produce local anesthesia, especially the solution of quinin and urea hydrochlorid. The ordinary quinin salt are markedly irritant. In large doses it produces depression of the heart and respiration, and collapse. In toxic doses quinin may produce more or less complete hemianopia terminating in permanent loss of sight. Moderately large doses of quinin act as a stimulant to the uterine muscles, but do not produce such spasmodic contractions as ergot.

Quinin may be used as a tonic, like the simple bitters, for the improvement of digestion and nutrition.

Its chief use is as an antiperiodic in malaria. In this disease it should be given in large doses several hours before the time of the expected chill.

DOSAGE: 0.1 to 0.25 Gm. or 1½ to 4 grains. In malaria 1 Gm. or 15 grains may be given at a dose. For ordinary use it is preferably administered in the form of capsules. For use as a bitter tonic it is given in solution. For its use as a local anesthetic see **quinin and urea hydrochlorid.** In medicine quinin is customarily used in the form of one of the official or unofficial salts.

The intensely bitter taste of quinin and its soluble salts, which constitutes the greatest objection to its use, especially with children, may be masked by administering the alkaloid or the insoluble tannate in syrup of glycyrrhiza or syrup of yerba santa.

Quininae Bisulphas (Quin. Bisulph.), Quinin Bisulphate, U. S. P.—The acid sulphate, $C_{20}H_{24}O_2N_2.H_2SO_4+7H_2O$, of the alkaloid quinin.

PROPERTIES: Quinin bisulphate occurs in colorless, transparent crystals or as small whitish needles, odorless and having a very bitter taste. It is freely soluble in water (1: 8.5) and soluble in alcohol (1: 18).

DOSAGE: Tonic, 0.1 Gm. or 1½ grains; antimalarial, 1 Gm. or 15 grains.

Quininae et Ureae Hydrochloridum (Quin. et Urea. Hydrochl.), Quinin and Urea Hydrochlorid, U. S. P. (Quinin and Urea Chlorid).—The compound of quinin hydrochlorid and urea hydrochlorid, $C_{20}H_{24}O_2N_2.HCl.CO(NH_2)_2.HCl+5H_2O$, containing not less than 58 per cent. of anhydrous quinin.

PROPERTIES: Quinin and urea hydrochlorid occurs as colorless prisms or as a white, granular powder, odorless and having a very bitter taste. It is freely soluble in water (1: 0.9) and in alcohol (1: 2.4).

ACTION AND USES: Quinin and urea hydrochlorid has the actions of quinin. It is non-irritating when injected hypodermically but exerts an anesthetic action similar to that of cocain. It is reported that the anesthesia is in some cases prolonged for several days. Quinin and urea hydrochlorid is especially useful in the treatment of malaria by hypodermic injections.

DOSAGE: Tonic and antimalarial, the same as that of quinin. For the production of local anesthesia, injection of a solution of form 0.25 to 1 per cent. strength is said to be free from the risk of producing fibrous indurations, which sometimes occur with the stronger solution. For application to mucous membranes solutions varying in strength from 10 to 20 per cent. should be used.

Quininae Hydrochloridum (Quin. Hydrochl.), Quinin Hydrochlorid, U. S. P. (Quinin Chlorid).—The hydrochlorid, $C_{20}H_{24}O_2N_2.HCl+2H_2O$, of the alkaloid quinin.

PROPERTIES: Quinin hydrochlorid occurs as white, silky, glistening needles, odorless and having a very bitter taste. It is soluble in water (1: 18) and very soluble in alcohol (1: 0.8).

DOSAGE: Tonic, 0.1 Gm. or 1½ grains; antimalarial, 1 Gm. or 15 grains.

Quininae Sulphas (Quin. Sulph.), Quinin Sulphate, U. S. P.—The sulphate, $(C_{20}H_{24}O_2N_2)_2H_2SO_4+7H_2O$, of the alkaloid quinin.

PROPERTIES: Quinin sulphate occurs as white, glistening crystals of prismatic needles, odorless and having a very bitter taste. It is only slightly soluble in water (1: 725) and in alcohol (1: 107).

DOSAGE: Tonic, 0.1 Gm. or 1½ grains; antimalarial, 1 Gm. or 15 grains.

Quininae Tannas (Quin. Tann.), Quinine Tannate, U. S. P.—A compound of the alkaloid quinin with tannic acid, containing from 30 to 35 per cent. of quinin.

PROPERTIES: Quinin tannate occurs as an amorphous, pale lemon-yellow, odorless powder without taste, or at most slightly bitter, with scarcely an astringency. It is only slightly soluble in water, but *freely soluble in alcohol* (1: 3).

DOSAGE: 0.5 Gm. or 7½ grains.

RESINAE, RESINS.—Resins are usually made by distilling the volatile oil from natural oleoresins or by precipitating resins from alcoholic solutions by the addition of water.

For the preparation included in this list see.

RESINA PODOPHYLLI, under **Podophyllum.**

Resorcinol (Resorcin.), Resorcinol, U. S. P. (Resorcin).—The diatomic phenol, metadihydroxybenzene, $C_6H_4(OH)_2$ 1:3.

PROPERTIES: Resorcinol occurs as colorless or nearly colorless needle-shaped crystals, having a faint, peculiar odor and a sweetish, followed by a bitter taste. It is very soluble in water (1: 0.9) and in alcohol (1: 0.9).

ACTION AND USES: Resorcinol is antiseptic, antizymotic and antipyretic. On account of the readiness with which it causes the formation of methemoglobin and the resulting danger of collapse it is seldom administered internally. It is sometimes given to check fermentation in the stomach. Applied externally it is astringent in from 1 to 3 per cent. solutions, and keratolytic in strong proportions, from 10 to 20 per cent.

DOSAGE: 0.125 Gm. or 2 grains.

Rhamnus Purshiana.—See **Cascara Sagrada.**

Rheum, Rhubarb, U. S. P.—The rhizome and roots of *Rheum officinale* and of other species of *Rheum* are occasionally administered either in the form of powder or in the form of "cubes" or "fingers."

ACTION AND USES: Rhubarb and the extract are cathartics, bitter tonics and stomachics, while the aromatic tincture and the aromatic syrup are laxative and to a slight extent astringent. As cathartics they act chiefly on the colon and have a tendency to produce constipation after the initial laxative effect. Hence they are an appropriate remedy in the beginning of diarrhea as they cause the expulsion of irritating substances and promote a return to normal by their constipating influence.

DOSAGE: 1 Gm. or 15 grains.

EXTRACTUM RHEI (EXT. RHEI), EXTRACT OF RHUBARB, U. S. P. (Powdered Extract of Rhubarb).—A hydroalcoholic extract of rhubarb evaporated to dryness and powdered. Represents twice its weight of rhubarb.
DOSAGE: 0.25 Gm. or 4 grains.

TINCTURA RHEI AROMATICA (TR. RHEI AROM.), AROMATIC TINCTURE OF RHUBARB, U. S. P.—Represents rhubarb (20 Gm.), cinnamon (4 Gm.), cloves (4 Gm.) and myristica (2 Gm.), in a mixture of glycerin, alcohol (46 per cent.) and water to make 100 Cc.

DOSAGE: 2 Cc. or 30 minims.

SYRUPUS RHEI AROMATICUS (SYR. RHEI AROM.), AROMATIC SYRUP OF RHUBARB, U. S. P. (Spiced Syrup of Rhubarb).—For all practical purposes this represents aromatic tincture of rhubarb (15 Cc.) with sufficient syrup to make 100 Cc.

DOSAGE: 10 Cc. or 2½ fluidrams.

Ricini Oleum (Ol. Ricin.), Castor Oil, U. S. P. (Oleum Ricini).—A fixed oil expressed from the seed of ***Ricinus communis.***

PROPERTIES: Castor oil occurs as a pale yellowish or almost colorless viscid liquid, having a faint, mild odor and a bland afterward slightly acrid and generally offensive taste. It is practically insoluble in water, but freely soluble in alcohol (1: 1).

ACTION AND USES: Castor oil is used as a profuse cathartic, mildly irritating both the small and the large intestine, and locally, particularly in the eye, as a demulcent.

DOSAGE: 15 Cc. or 4 fluidrams.

Castor oil may be administered in the form of emulsion, Emulsum Olei Ricini, N. F., a 35 per cent. emulsion, or it may be given after wetting the mouth with some hot liquid and giving the oil floating in the liquid. For this purpose milk or tea may be used. Preparations are on the market in which the taste is largely concealed by the addition of saccharin and essential oils, the castor oil itself being made more limpid by the addition of alcohol. To children it may be given suspended in soda water.

Rosa, Rose.—Used in pharmacy chiefly in the form of:

AQUA ROSAE (AQ. ROS.), ROSE-WATER, U. S. P.—A solution of the volatile oil of rose in water. It is official as Aqua Rosae and as Aqua Rosae Fortior. The latter, a saturated aqueous distillate, is twice the strength of the former.

ACTION AND USES: Rose-water and stronger rose water are used for flavoring.

Saccharum (Sacch.), Sugar, U. S. P.—Refined sucrose, $C_{12}H_{22}O_{11}$, obtained from various sources.

PROPERTIES: Sugar is official in the form of white, dry, hard, distinctly crystalline granules, odorless and having a purely sweet taste. It is very soluble in water (1: 0.5) and soluble in alcohol (1: 170).

ACTION AND USES: In medicine it is used as a diluent either as sugar or in the form of:

SYRUPUS, SYRUP, U. S. P. (Sirup, Simple Syrup).—An *aqueous solution* of sugar containing approximately 85 *Gm. of sugar in 100* Cc. of the liquid.

Saccharum Lactis (Sacch. Lact.), Sugar of Milk, U. S. P. (Milk-Sugar, Lactose).—A crystalline sugar, $C_{12}H_{22}O_{11}+H_2O$, obtained from the whey of cow's milk by evaporation, and purified by recrystallization.

PROPERTIES: Sugar of milk occurs as white, hard, crystalline masses or a white powder feeling gritty on the tongue, odorless and having a faintly sweet taste. It is freely soluble in water (1: 4.9), but practically insoluble in alcohol.

ACTION AND USES: Sugar of milk is used as a diluent, and also as a food, particularly in connection with modified milk for infants.

SALES EFFERVESCENTES, EFFERVESCENT SALTS.—Effervescent salts are mixtures of soluble salts with sodium bicarbonate and citric or tartaric acid, or a mixture of the two acids, designed to yield effervescent drafts when added to water.

For preparations included in this list see:

POTASSI CITRAS EFFERVESCENS, under **Potassii Citras.**

PULVIS EFFERVESCENS COMPOSITUS, under **Potassii et Sodii Tartras.**

SODII PHOSPHAS EFFERVESCENS, under **Sodii Phosphas.**

Salvarsan, Salvarsan, N. N. R.—Also known as arsenobenzol, "606", and arsenophenolamin hydrochlorid, is 3-diamino-4-dihydroxyl-1-arseno benzene hydrochlorid. Corresponds to 31.57 per cent. arsenic (As).

PROPERTIES: Salvarsan occurs as a yellow, crystalline, hygroscopic powder, very unstable in air. It is soluble in water, yielding a solution with an acid reaction.

ACTION AND USES: Salvarsan is useful as a specific remedy for syphilis in all stages, but is the more efficient the more recent the infection. It is especially indicated in the primary stage; in the later stages it should be given in repeated doses, in conjunction with mercurial courses. In mucous membrane lesions, and in cases of malignant syphilis which resist mercury, it is often efficient.

Salvarsan is useful in various spirillar diseases such as relapsing fever, Vincent's angina, etc. In Vincent's angina local applications of the powder have been found useful, in addition to the intravenous administration. The drug administered intravenously cannot reach the spirilla embedded in the necrotic tissue of the throat.

In certain cases salvarsan has produced toxic results which are equivalent to poisoning by arsenic. These have occurred more commonly after the intramuscular injections. The intramuscular injection is painful and is usually followed by a tender, inflammatory nodule, which persists for some time. The intramuscular injection has now been practically discarded by all syphilologists.

After intravenous injections certain nervous symptoms have frequently arisen which have received the name of neurorecidiv (nervous relapse). The evidence seems to

show that these nervous conditions are due not to the action of salvarsan but to the increased activity of the spirochetes. They are best treated, therefore, by a specific remedy: another dose of salvarsan or a compound of mercury.

The optic neuritis which is so frequently produced by other preparations of arsenic has occurred very rarely in connection with salvarsan. The drug has been employed successfully in all types of syphilitic eye disease. Repeated doses should be given.

DOSAGE: From 0.3 to 0.6 Gm. or 5 to 9 grains.

For intravenous injection a clear alkaline solution is used. The contents of a tube should be used at once after opening and under no conditions should the contents of a tube, damaged in transportation, or any remnant of the powder from previously used tubes, be employed.

Special care should be taken to see that the water used in making the solutions is freshly distilled and completely sterile. Various forms of apparatus have been devised to facilitate intravenous injections. Of these, some form of graduated gravity pipet connected with a tube fitted with a three-way stop-cock seems most suitable.

In the treatment of syphilis of the central nervous system the Swift-Ellis method of intraspinal treatment is utilized at times. The technic is as follows:

An injection of the usual dose of salvarsan or neosalvarsan is given intravenously. One hour after the injection 40 Cc. of blood are withdrawn by venipuncture. This is allowed to clot and left on ice for twenty-four hours. The serum is then pipetted off and centrifuged: 12 c.c. of this serum is usually added to 18 Cc. of sterile normal salt solution to make a 40 per cent. solution of salvarsanized serum although it may be used without dilution. This is then heated for thirty minutes at 56 C. Before making the intraspinal injection a volume of spinal fluid equal to that of the injection is often withdrawn.

In tabes dorsalis the results from this method are, as a rule, more satisfactory than with the ordinary intravenous therapy. The pains have disappeared, the reaction in the cerebral spinal fluid has returned more or less completely to normal, and certain symptoms, such as diminution of bladder control and sexual power, which are usually looked on as fundamental phenomena, may disappear entirely or be greatly improved. Patients also feel better.

In cerebrospinal lues also the intraspinal method has been used to a considerable extent. It is questionable, however, whether the results are much better than those of the intravenous method.

In dementia paralytica the results of this method have been distinctly disappointing.

NEOSALVARSAN.—The name applied to a mixture of sodium *3 - diamino - 4 - dihydroxy - 1 - arsenobenzene - methanal-sulphoxylate with* inert, inorganic salts. The arsenic

content of 3 parts of neosalvarsan is approximately equal to 2 parts of salvarsan. Solutions of neosalvarsan are more readily prepared; otherwise its actions and uses, as well as the precautions to be observed, are the same as for salvarsan.

ACTION AND USES: The same as those of salvarsan although many observers claim better results from the latter. Neosalvarsan differs, however, from salvarsan in that it dissolves readily in sterile water, making a neutral solution which can at once be injected. Water not warmer than from 20 to 22 C (68 to 71.6 F.) should be used and the injections should be made at once, as neosalvarsan oxidizes rapidly and becomes toxic.

Neosalvarsan can be given in concentrated solution intravenously using 10 Cc. sterile distilled water for 0.45 to 0.6 Gm. and 15 Cc. for 0.75 to 0.9 Gm. neosalvarsan.

Santali Oleum (Ol. Santal.), Oil of Santal, U. S. P. (Oleum Santali, Sandalwood Oil, Oil of Sandalwood).—A volatile oil distilled from the wood of *Santalum album.*

PROPERTIES: Oil of santal occurs as a pale yellow, somewhat thick liquid, having the characteristic odor of sandalwood, and a pungent, spicy taste. Readily soluble in alcohol, but practically insoluble in water.

ACTION AND USES: Oil of santal is a stimulant and antiseptic to the bronchial mucous membrane and especially to the mucous membranes of the genito-urinary tract. It is not employed in the treatment of respiratory diseases, but is used extensively in the treatment of gonorrhea. It is not suitable to the acute stages, but should be used in the subacute and chronic stages.

DOSAGE: 0.5 Cc. or 8 minims.

Santoninum (Santonin.), Santonin, U. S. P.—The inner anhydrid or lactone of santonic acid obtained from *Artemisia Cina* and possibly other species of *Artemisia.*

PROPERTIES: Santonin occurs as colorless, rhombic prisms or a crystalline powder, odorless and nearly tasteless when first put into the mouth, but afterward developing a bitter taste. It is very slightly soluble in water (1: 5,300), and soluble in alcohol (1: 43).

ACTION AND USES: Santonin is used for its poisonous action on intestinal parasites. It is seldom absorbed to a sufficient extent to produce symptoms. When this occurs, the chief effects are yellow vision and epileptiform convulsions.

It is used especially for its effect on roundworms. In proper doses it is a reasonably safe drug. It is frequently administered with calomel.

DOSAGE: 0.06 Gm. or 1 grain.

As absorption is to be avoided the remedy is preferably administered in the form of coarse crystals, either inclosed in a capsule or made up into a lozenge rather than in finely

powdered form. The soluble sodium santoninate should be avoided as a vermifuge.

Sapo, Soap, U. S. P. (White Castile Soap).—Soap prepared from sodium hydroxid and olive-oil (Castile soap).

PROPERTIES: Soap occurs as a white or whitish solid, hard yet easily cut when fresh, or as a fine yellowish white powder, having a faint peculiar odor free from rancidity, a disagreeable alkaline taste and an alkaline reaction. It is soluble in water and in alcohol.

LINIMENTUM SAPONIS (LIN. SAPON.), SOAP LINIMENT, U. S. P. (Liquid Opodeldoc).—A solution of soap, camphor and oil of rosemary in a mixture of alcohol and water.

ACTION AND USES: Soap liniment applied externally is stimulant and rubefacient, but is used more frequently as a vehicle for the local application of other more active counterirritants.

Sapo Mollis (Sapo Moll.), Soft Soap, U. S. P.—A soap prepared from potassium hydroxid and cottonseed oil.

PROPERTIES: Soft soap occurs as a soft, unctuous, yellowish-white to yellowish-brown mass, having a characteristic odor and an alkaline taste.

ACTION AND USES: Soft soap is used principally as a detergent; being soluble in alcohol, and in mixtures of alcohol and water it is frequently used as a liquid soap. It has also been used to some extent as a vehicle for other more active medicaments to be applied in the form of an ointment.

Scilla (Scill.), Squill, U. S. P.—The bulb of *Urginea maritima*. It is occasionally administered in the form of powder. When extracted and assayed biologically the minimum lethal dose should not be greater than the equivalent of 0.6 mg. of squill for each gram of body-weight of the frog.

ACTION AND USES: The pharmacologic actions of squill resemble those of digitalis qualitatively, but the emetic action appears to be more prominent with squill, and this has led to its use as an emetic in the past, and it is still used as a nauseant expectorant in the first stages of laryngitis, bronchitis, etc.; but it seems unwise to use a drug which affects the heart so powerfully when we have other nauseants, such as ipecac, which have less undesirable side actions. Squill appears to be absorbed slowly from the gastro-intestinal tract, but its emetic effects are due to its action on the vomiting center in the medulla.

Squill is used frequently to promote diuresis, which it probably does after the manner of digitalis, through its action on the heart. Hence digitalis can always be used in *its place to induce* an increased secretion of urine.

DOSAGE: 0.1 Gm. or 1½ grains.

TINCTURA SCILLAE (TR. SCILL.), TINCTURE OF SQUILL, U. S. P.—One hundred Cc. represent 10 Gm. of squill in approximately 70 per cent. alcohol. If assayed biologically the minimum lethal dose should not be greater than 0.006 Cc. for each gram of body-weight of the frog.

DOSAGE: 1 Cc. or 15 minims.

SYRUPUS SCILLAE (SYR. SCILL.), SYRUP OF SQUILL, U. S. P.—A mixture of a diluted acetic acid extract of squill, 4.5 Gm., with syrup to make 100 Cc.
DOSAGE: 2 Cc. or 30 minims.

Scopolaminae Hydrobromidum (Scopolamin. Hydrobrom.), Scopolamin Hydrobromid, U. S. P. (Hyoscin Hydrobromid, Hyoscin Bromid).—The hydrobromid, $C_{17}H_{21}NO_4.HBr+3H_2O$, of an alkaloid (levorotatory scopolamin) obtained from plants of the *Solanaceae*.

PROPERTIES: Scopolamin hydrobromid forms colorless crystals, odorless, having, in dilute solutions, an acrid, slightly bitter taste, freely soluble in water (1: 1.5) and in alcohol (1: 20).

INCOMPATIBILITIES: Scopolamin hydrobromid is incompatible with alkalies and other precipitants of alkaloids.

ACTION AND USES: Scopolamin resembles atropin in its influence on the nerve endings, but differs from it in having a sedative instead of a stimulating effect on the brain. It is used as a cerebral sedative in cases of mania and other forms of insanity, but must be employed with caution, as it sometimes induces a rapid fall in blood-pressure and collapse. It has been extensively used in conjunction with morphin for the production of surgical anesthesia, either as a preliminary to the use of ether or chloroform, or as the operation anesthetic. It is liable to produce dangerous depression of the respiration. Experience in these methods of anesthesia has not been satisfactory. It has been employed as a partial anesthetic in labor, but experience shows that the effect on the fetus is sometimes disastrous, many children being born dead or asphyxiated.

It is frequently used as a mydriatic and is regarded by some ophthalmologists as preferable to atropin because it is less irritating, and produces a brief and complete cycloplegia.

DOSAGE: 0.3 mg. or $\frac{1}{200}$ grain.

Senna (Senn.), Senna, U. S. P.—The dried leaflets of *Cassia acutifolia* (Alexandria senna), or of *Cassia angustifolia* (India or Tinnevelly senna).

ACTION AND USES: Senna belongs to the anthraquinone-containing group of vegetable purgatives and is considered to be one of the more efficient drugs of this class. It is largely used for the treatment of chronic constipation.

DOSAGE: 4 Gm. or 1 dram, administered either in the form of powder or as an infusion.

FLUIDEXTRACTUM SENNAE (FLDEXT. SENN.), FLUIDEXTRACT OF SENNA, U. S. P.—A hydro-alcoholic extract, 100 Cc. of which represent 100 Gm. of senna.

DOSAGE: 2 Cc. or 30 minims.

SYRUPUS SENNAE (SYR. SENN.), SYRUP OF SENNA, U. S. P.—Represents a mixture of fluidextract of senna (25 Cc.) with syrup (sufficient to make 100 Cc.).
DOSAGE: 4 Cc. or 1 fluidram.

PULVIS GLYCYRRHIZAE COMPOSITUS (PULV. GLYCYRRH. CO.), COMPOUND POWDER OF GLYCYRRHIZA, U. S. P. (Compound Licorice Powder).—A mixture of senna (18 Gm.), glycyrrhiza (23.6 Gm.), sulphur (8 Gm.), oil of fennel (0.4 Gm.), and sugar (50 Gm.).

ACTION AND USES: Pulvis Glycyrrhizae Compositus has been widely used as a laxative.

DOSAGE: 4 Gm. or 1 dram, administered mixed with a suitable liquid, preferably milk.

SERA ET VACCINA, SERUMS AND VACCINES.—The vaccines, viruses and serums constitute one of the most important groups of drugs with which the physician has to deal. Some preparations of this group are specific cures for certain diseases; others are invaluable in prophylaxis and diagnosis. The supervision of these drugs is in charge of the United States Public Health Service, which periodically makes inspections of laboratories licensed in accordance with the law passed by Congress in 1902. Antidiphtheric and antitetanic serums are required to conform strictly to the standards which have been established by the United States Public Health Service. There being no established standard for the various other products, they are not examined for their therapeutic value in the laboratory but are tested for the amount of preservative and freedom from bacterial and toxic contaminations. The preparations of this class most widely used are the following, which will be found in their respective alphabetical positions in this book:

ANTITETANIC SERUM, under **Serum Antitetanicum.**

ANTIDIPHTHERIC SERUM, under **Serum Antidiphthericum.**

BACTERIAL VACCINES, under **Vaccina.**

STAPHYLOCOCCUS VACCINE, under **Vaccinum Staphylococcicum.**

TUBERCULIN, under **Tuberculinum.**

TYPHOID VACCINE, under **Vaccinum Typhosum.**

VACCINE VIRUS, under **Virus Vaccinicum.**

Serum Antidiphthericum (Ser. Antidiph.), Antidiphtheric *Serum*, U. S. P. (Diphtheria Antitoxin).—A fluid separated from the coagulated blood of the horse immunized through the inoculation of diphtheria toxin.

PROPERTIES: Antidiphtheric serum occurs as a yellowish or yellowish-brown, transparent or slightly turbid liquid, nearly odorless or having a slight odor due to the presence of an antiseptic used as a preservative. The standard of strength, expressed in units of antitoxic power, must be that approved or established by the United States Public Health Service.

ACTION AND USES: Antidiphtheric serum neutralizes the toxin of diphtheria and is employed both as a curative and as a prophylactic agent in that disease. It is to be administered hypodermically.

DOSAGE: The dose of diphtheria antitoxin is measured by antitoxic units. Five hundred, or better 1,000 units are given as an immunizing or prophylactic dose. For curative treatment from 5,000 to 40,000 units should be given as an initial dose, according to the severity of the symptoms. Subsequent injections are much less effectual and usually are not required if a sufficient initial dose has been given. In urgent cases it may be given intravenously. If there is reason to fear hypersusceptibility to horse serum, 0.1 c.c. may be administered subcutaneously and the dose doubled hourly till the full dose is given.

Antidiphtheric serum is also official as:

SERUM ANTIDIPHTHERICUM PURIFICATUM (SER. ANTIDIPH. PURIF.), PURIFIED ANTIDIPHTHERIC SERUM, U. S. P. (Antidiphtheric Globulins, Concentrated Diphtheria Antitoxin, Diphtheric Antitoxin Globulins, Refined and Concentrated Diphtheria Antitoxin).—A solution in physiologic sodium chlorid solution of certain antitoxic substances obtained from the blood serum or plasma of the horse which has been properly immunized against diphtheria toxin. This product has the advantage of diminishing the incidence of serum disease.

DOSAGE: Same as that of Serum Antidiphthericum.

SERUM ANTIDIPHTHERICUM SICCUM (SER. ANTIDIPH. SICC.), DRIED ANTIDIPHTHERIC SERUM, U. S. P. (Dried Diphtheria Antitoxin).—Obtained by the evaporation of either antidiphtheric serum or purified antidiphtheric serum.

DOSAGE: Same as that of Serum Antidiphthericum.

Serum Antimeningococcum (Ser. Antimening.), Antimeningococcus Serum.—A fluid separated from the coagulated blood of horses which have been properly immunized against antimeningococcus cultures.

PROPERTIES: Antimeningococcus serum occurs as a yellowish or yellowish-brown slightly turbid liquid; ordorless or having an odor due to the presence of the antiseptic used as preservative. There are no standards of potency and the rate of deterioration is not known.

ACTIONS AND USES: Effective as a curative agent.

DOSAGE: The serum is to be used only intrathecally, the usual procedure being to withdraw the spinal fluid and introduce an equal amount or somewhat less of the serum.

The dose varies; 5 Cc. may be considered the maximum safe dose for a young child and 30 Cc. for an adult. Serum should be continued so long as active symptoms remain.

Serum Antitetanicum (Ser. Antitetan.), Antitetanic Serum, U. S. P. (Tetanus Antitoxin).—A fluid separated from the coagulated blood of the horse which has been properly immunized against tetanus toxin.

PROPERTIES: Antitetanic serum occurs as a yellowish or yellowish-brown, transparent or slightly turbid liquid, odorless or having an odor due to the presence of the antiseptic used as a preservative. It gradually loses its potency, the loss being greater at higher than at lower temperatures. The standard of strength expressed in units of antitoxic power must be that approved or established by the United States Public Health Service.

ACTION AND USES: Effective as a prophylactic and of some value as a curative agent in tetanus. The dried product may be used as a dusting powder in suspicious wounds.

DOSAGE: Immunizing dose, on day of wound and repeated weekly till healed: 1,500 units subcutaneously. In actual tetanus, 3,000 to 5,000 units diluted with an equal volume of physiologic saline solution, intraspinally, and 10,000 units intravenously at the earliest possible moment; the intraspinal dose to be repeated daily until recovery is assured, and 10,000 units to be given subcutaneously on the fourth day.

Antitetanic serum is also marketed as:

SERUM ANTITETANICUM PURIFICATUM (SER. ANTITETAN. PURIF.), PURIFIED ANTITETANIC SERUM, U. S. P. (Antitetanic Globulins, Concentrated Tetanus Antitoxin, Refined and Concentrated Tetanus Antitoxin, Solution of Tetanus Antitoxic Globulin).—A solution in physiologic solution of sodium chlorid of certain antitoxic substances obtained from the blood serum or plasma of a horse which has been properly immunized against tetanus toxin.

DOSAGE: Same as that of Serum Antitetanicum.

SERUM ANTITETANICUM SICCUM (SER. ANTITETAN. SICC.), DRIED ANTITETANIC SERUM, U. S. P. (Dried Tetanus Antitoxin).—Dried antitetanic serum is obtained by the evaporation of either antitetanic serum or purified antitetanic serum.

DOSAGE: Same as that of Serum Antitetanicum.

Sinapis Nigra (Sinap. Nig.), Black Mustard, U. S. P. (Brown Mustard).—The seed of *Brassica nigra.*

ACTION AND USES: Mustard is used extensively as a counterirritant. When mustard is mixed with water, the volatile oil is generated by the action of a ferment, myrosin, *on a princi*ple called sinigrin, contained in black mustard.

DOSAGE: As an emetic, 8 Gm. or 120 grains.

EMPLASTRUM SINAPIS (EMP. SINAP.), MUSTARD PLASTER, U. S. P. (Charta Sinapis, U. S. P., VIII, Mustard Paper).—A coating of black mustard on rather thick, well-sized paper, cotton cloth or other fabric, used in place of the domestic mustard poultice.

OLEUM SINAPIS VOLATILE (OL. SINAP. VOL.), VOLATILE OIL OF MUSTARD, U. S. P. (Mustard Oil).—A volatile oil obtained from black mustard by maceration with water and subsequent distillation, yielding, when assayed by the process given in the U. S. Pharmacopeia, not less than 92 per cent. of allyl iso-thiocyanate.

PROPERTIES: Volatile oil of mustard occurs as a colorless or pale yellow, limpid liquid, having a very pungent and irritating odor. Great caution should be exercised when smelling this oil, and it should not be tasted without being highly diluted. It is miscible with alcohol in all proportions, and is generally soluble in liquids containing alcohol.

ACTION AND USES: See **Sinapis Nigra.**

DOSAGE: 0.008 Cc. or ⅛ minim.

Sodii Arsanilas, Sodium Arsanilate, N. N. R. (Atoxyl, Sodium Anilin Arsonate, Sodium Aminophenyl Arsonate).—Sodium arsanilate, $C_6H_4(NH_2)(AsO.OH.ONa)$, is the sodium salt of arsanilic acid, prepared by condensing anilin and arsenic acid.

PROPERTIES: Sodium arsanilate occurs as white, odorless crystals, having a faint salty taste and being freely soluble in water (1: 6). The aqueous solution, on standing, assumes a yellowish tint.

ACTION AND USES: Sodium arsanilate has been recommended for the conditions which are favorably influenced by arsenic. The arsenic of the acid is liberated very slowly in the system, producing the therapeutic effects of arsenic with a more continuous and less toxic action. Toxic effects have been frequently noted, however, and the use of all forms of sodium arsanilate has been followed by degeneration of the optic nerve, leading to blindness. This substance has been employed extensively in the treatment of trypanosomiasis, but the frequent cases of blindness resulting have restricted its use.

DOSAGE: 0.02 Gm. or ⅓ grain, gradually increased.

Sodii Arsenas (Sod. Arsen.), Sodium Arsenate, U. S. P. (Arsenas Sodii, P. I.).—Corresponds to not less than 99 per cent. of $Na_2HAsO_4+7H_2O$.

PROPERTIES: Sodium arsenate occurs as colorless, transparent monoclinic prisms, odorless, and having a mild alkaline taste. It is freely soluble in water (1: 5) and nearly insoluble in alcohol.

ACTION AND USES: Sodium arsenate has an arsenic action and has been employed in chronic skin diseases, anemias, etc.

DOSAGE: 0.005 Gm. or 1/12 grain, usually given in the form of solution or pill.

Sodii Benzoas (Sod. Benz.), Sodium Benzoate, U. S. P.—Contains not less than 99 per cent. of $NaC_7H_5O_2$.

PROPERTIES: Sodium benzoate occurs as a white, amorphous powder, odorless, and having a sweetish taste. It is freely soluble in water (1: 1.8) and soluble in alcohol (1: 61).

INCOMPATIBILITIES: It is incompatible with mineral acids and with ferric salts.

ACTION AND USES: Sodium benzoate has an internal action similar to that of sodium salicylate, but very much weaker, so that the latter salt is generally preferred.

DOSAGE: 1 Gm. or 15 grains. It is usually administered in the form of solution.

Sodii Bicarbonas (Sod. Bicarb.), Sodium Bicarbonate, U. S. P.—Contains not less than 99 per cent. of $NaHCO_3$.

PROPERTIES: Sodium bicarbonate occurs as a white, opaque powder, odorless and having a cooling, mildly alkaline taste. It is soluble in water (1: 10) at 15 C., practically without decomposition, but above this temperature the solution gradually loses carbon dioxid, and at the boiling point of water the salt is converted into normal carbonate; it is practically insoluble in alcohol.

INCOMPATIBILITIES: Sodium bicarbonate is incompatible with acids and acid salts, and the solution should be made with cold water, which tends to prevent its conversion into the more alkaline carbonate.

ACTION AND USES: Sodium bicarbonate alone or in combination with bismuth subcarbonate or magnesia is used to neutralize the acid of the gastric juice in hyperacidity, acid dyspepsia, etc. It is used to render the urine alkaline in gravel, pyelitis, etc.

Large doses are given by the mouth in cases of acidosis in diabetes or from any other cause. Sodium bicarbonate may be used intravenously in cases of extreme acidosis. It should never be injected hypodermically or intramuscularly unless special precautions are observed as it is very likely to cause sloughing. (See under Dosage.)

Externally it is used as a mild alkaline wash. Solutions of sodium bicarbonate are antipruritic. A weak solution is employed to soften impacted cerumen. Sodium bicarbonate may be employed to neutralize acetic or citric acids for the extemporaneous preparation of sodium acetate or citrate.

DOSAGE: 1 Gm. or 15 grains. Much larger doses may be given in acidosis. As much as 60 Gm. or 2 ounces may be given daily. It may be administered by a "drop enema" of a 4 per cent. solution. For intravenous injection a 6 per cent. solution sterilized by boiling and hence partly converted into the carbonate has been recommended. One thousand Cc. of such a solution may be injected, but great care must be taken that none of the liquid gets outside the vein lest necrosis of the tissues occur.

In certain exceptional cases where sodium bicarbonate *cannot be given* by mouth or intravenously it may be

injected subcutaneously or intramuscularly in 3 or 4 per cent. strength. After thorough sterilization and cooling of the solution carbon dioxid should be bubbled through the solution until it is colorless to phenolphthalein. The solution is then much less likely to cause necrosis.

Sodii Biphosphas (Sod. Biphos.), Sodium Acid Phosphate, N. N. R.—The monosodium dihydrogen salt, $NaH_2PO_4 + H_2O$, of orthophosphoric acid, H_3PO_4.

PROPERTIES: Sodium acid phosphate occurs as large, colorless, transparent crystals or a white, granular crystalline powder, odorless and having a cooling, saline and somewhat acid taste; slightly deliquescent. It is very soluble in water; insoluble in alcohol, ether and chloroform.

ACTION AND USES: Sodium acid phosphate undergoes no change in the stomach, but in the intestine is neutralized, by alkali drawn from the blood, into disodium hydrogen phosphate. The reduction of the alkalinity of the system which would otherwise result is prevented by the excretion of acid in the urine. Sodium acid phosphate thus renders the urine acid or increases its acidity, and is therefore used to assist the action of hexamethylenamin, which is effective only in acid urine. For this purpose the acid phosphate should be given long enough in advance so that it will have left the stomach before the hexamethylenamin enters it. In larger doses sodium acid phosphate produces laxative effects similar to those produced by the official disodium hydrogen phosphate (sodium phosphate, U. S. P.).

DOSAGE: From 1 to 1.5 Gm. (15 to 20 grains), in water, repeated every two or three hours, for five or ten doses, until the urine becomes acid. Sodium acid phosphate may be administered in sweetened water like lemonade. It should not be prescribed in solution with hexamethylenamin.

Sodii Boras (Sod. Bor.), Sodium Borate, U. S. P. (Borax, Sodium Tetraborate, Sodium Pyroborate).—Corresponds to not less than 99 per cent. of $Na_2B_4O_7 + 10H_2O$.

PROPERTIES: Sodium borate occurs as colorless, transparent crystals or a white powder, inodorous, and having a sweetish alkaline taste. It is soluble in water (1: 15), but practically insoluble in alcohol.

INCOMPATIBILITIES: Sodium borate is decomposed by mineral salts and is incompatible with mucilage of acacia, with the metallic salts of the mineral acids and with the salts of most alkaloids.

ACTION AND USES: Sodium borate is antiseptic, astringent and detergent and is used both externally and sometimes internally in the form of solution. The continuous ingestion of small doses produces a deleterious effect. Moderate to large doses may cause nephritis. Very large doses cause gastro-enteritis, nephritis, skin eruptions, visual disturbances, fall of temperature, collapse and a wide-spread fatty degeneration. It is used in from 1 to 2 per cent. solution as an eye-wash in hyperemia of the conjunctiva and catarrhal conjunctivitis.

For this purpose the following formula is very serviceable:

	Gm. or Cc.	
℞ Sod. boratis	5	gr. x
Aq. camph.	10	ʒ ii
Aq. dest. ad	25	ʒ j

It is sometimes used as an antipruritic solution:

℞ Sodii boratis	1	gr. xv
Glycerini	6	♏ x
Aquae	30	ʒ j

Dosage: 0.5 Gm. or 7½ grains. It may be used as a gargle.

Sodii Bromidum (Sod. Brom.), Sodium Bromid, U. S. P.—Contains not less than 98.5 per cent. of NaBr.

Properties: Sodium bromid occurs as colorless or white, cubical crystals, or a white, granular powder, odorless, and having a saline, slightly bitter taste. It is freely soluble in water (1: 1) and soluble in alcohol (1: 16).

Action and Uses: Sodium bromid is used as a nerve sedative and cerebral depressant and in ordinary doses its action and uses are identical with those of potassium bromid, but it is said to be less irritating to the stomach. See **Potassium Bromid.**

Dosage: 1 Gm. or 15 grains. It is preferably administered in dilute aqueous solution.

Sodii Cacodylas (Sod. Cacodyl.), Sodium Cacodylate, U. S. P.—Sodium dimethylarsenate, $Na(CH_3)_2AsO_2$, the sodium salt of cacodylic acid (dimethyl arsenic acid), with a somewhat variable amount of water of crystallization.

Properties: Sodium cacodylate occurs as white crystals or a granular powder, very soluble in water (1: 0.5) and in alcohol (1: 2.5). The aqueous solution is alkaline toward litmus paper, but nearly neutral toward phenolphthalein.

Action and Uses: The action of sodium cacodylate is similar to that of other arsenic compounds, but it is much less toxic than the ordinary preparations of arsenic and is also less apt to cause undesirable side effects. This superiority is due to the slow liberation of the arsenous acid in the body.

Sodium cacodylate has been particularly recommended in obstinate psoriasis, pseudoleukemia; diabetes, anemia, chlorosis, tuberculosis, malarial cachexia, etc.

As it is sometimes decomposed in the stomach, it is preferable to give it hypodermically.

Dosage: 0.03 to 0.06 Gm. or ½ to 1 grain. It may be administered hypodermically in aqueous solution or given by mouth in elixir or in the form of pills.

Sodii Carbonas Monohydratus (Sod. Carb. Monohyd.), Monohydrated Sodium Carbonate, U. S. P.—The form in which *sodium carbonate* is now official. Contains not less than *99.5 per cent. of* $Na_2CO_3+H_2O$.

PROPERTIES: Monohydrated sodium carbonate occurs as a white, crystalline, granular powder, odorless and having a strongly alkaline taste. It is freely soluble in water (1: 3) and practically insoluble in alcohol. Sodium carbonate, as now official, contains but one molecule of water of crystallization, and is nearly twice as strong in alkaline power as the ordinary crystalline carbonate, $Na_2CO_3 + 12H_2O$, commonly known as "sal soda."

INCOMPATIBILITIES: Sodium carbonate is incompatible with acids and acid salts and with the salts of the heavy metals and of alkaloids.

ACTION AND USES: Sodium carbonate is an antacid and is employed in medicine chiefly in the preparation of alkaline baths. For this purpose it may be used in the proportion of from 2 to 6 ounces for 30 gallons of water.

DOSAGE: 0.25 Gm. or 4 grains.

Sodii Chloridum (Sod. Chlorid.), Sodium Chlorid, U. S. P. (Common Salt).—Contains not less than 99 per cent. of NaCl.

PROPERTIES: Sodium chlorid occurs as colorless, cubical crystals or as a white crystalline powder, odorless and having a purely saline taste. It is freely soluble in water (1: 2.8) and nearly insoluble in alcohol.

INCOMPATIBILITIES: Sodium chlorid is incompatible with salts of silver and lead.

ACTION AND USES: Sodium chlorid is used for preparing physiologic salt solution: 8.5 Gm. to 1,000 Cc. of sterile water. This solution is frequently referred to as normal salt solution, but should not be confused with the chemical normal solution of sodium chlorid. When given by mouth in large doses sodium chlorid is emetic, and, in proper dilution, a prompt laxative.

DOSAGE: As an emetic, 15 Gm. or 4 drams. As a laxative it is most conveniently given in 1 per cent. solution. The dose, 4 Gm. or 60 grains, should be dissolved in from 0.25 to 0.5 liter (from ½ to 1 pint) of water and drunk on an empty stomach.

Sodii Hydroxidum (Sod. Hydrox.), Sodium Hydroxid, U. S. P. (Caustic Soda, Sodium Hydrate).—Contains not less than 90 per cent. of NaOH.

PROPERTIES: Sodium hydroxid occurs as dry, white or nearly white flakes, fused masses or hard and brittle sticks, showing a crystalline fracture; odorless, and, in dilute solutions, having a caustic taste. Great caution is necessary in tasting and handling it, as it rapidly destroys organic tissue. It is very soluble in water (1: 0.9) and in alcohol.

ACTION AND USES: Sodium hydroxid has properties closely resembling those of potassium hydroxid. It is used chiefly for pharmaceutical purposes, though occasionally it is used locally as a caustic or in dilute solution as an alkaline wash. Solution of sodium hydroxid largely diluted has also been administered internally.

Liquor Sodii Hydroxidi (Liq. Sod. Hydrox.), Solution of Sodium Hydroxid, U. S. P. (Liquor Sodae, Solution of Soda).—An aqueous solution containing not less than 4.5 per cent. of sodium hydroxid, NaOH.

Dosage: 1 Cc. or 15 minims, well diluted.

Sodii Iodidum (Sod. Iod.), Sodium Iodid, U. S. P.—NaI.

Properties: Sodium iodid occurs as colorless, cubical crystals, or as a white, crystalline powder, odorless and having a saline and slightly bitter taste. It is very soluble in water (1: 0.5) and freely soluble in alcohol (1: 3).

Incompatibilities: Sodium iodid is incompatible with spirit of nitrous ether, bismuth salts, ferric salts, and the salts of many alkaloids.

Action and Uses: Sodium iodid has properties closely resembling those of potassium iodid, and like sodium bromid is perhaps less irritating than the potassium salt.

Dosage: 0.5 Gm. or 8 grains. For ordinary cases the dose may range from 0.3 to 1.25 Gm. or from 5 to 20 grains. When employed for the energetic treatment of tertiary syphilis it is sometimes necessary to increase the dose to from 2 to 5 Gm. or from 30 to 75 grains or more. It should not be given on an empty stomach but should be administered with some form of food, preferably liquid, such as milk.

Sodii Nitris (Sod. Nitris), Sodium Nitrite, U. S. P.—Contains not less than 95 per cent. of $NaNO_2$.

Properties: Sodium nitrite occurs as white, or nearly white, opaque, fused masses or sticks or as colorless, transparent crystals which are odorless and have a mild saline taste. It is freely soluble in water (1: 1.5) and very slightly soluble in alcohol.

Incompatibilities: It is incompatible with oxidizing agents generally. It must be protected from contact with the air on account of its tendency to oxidation.

Action and Uses: Sodium nitrite has the characteristic properties of the nitrites, and resembles nitroglycerin in its action, though its effect is manifested more slowly and is somewhat more lasting.

Dosage: 0.06 Gm. or 1 grain. It should be administered in solution.

Sodii Phosphas (Sod. Phos.), Sodium Phosphate, U. S. P.—Contains not less than 99 per cent. of $Na_2HPO_4+12H_2O$.

Properties: Sodium phosphate occurs as large, colorless, monoclinic prisms, or a granular, crystalline salt, odorless, and having a cooling saline taste. It is freely soluble in water (1: 5.5), but practically insoluble in alcohol.

Action and Uses: Sodium phosphate is used as a saline *cathartic,* and its mode of action has much in common with *magnesium sulphate* and sodium sulphate. It is less disagreeable, but is less active. By the addition of 1 c.c. of

dilute hydrochloric acid or 4 c.c. of dilute phosphoric acid to each gram of sodium phosphate, it is converted into the acid phosphate and may be used to render the urine acid (see **Sodii Biphosphas**).

DOSAGE: 2 Gm. or 30 grains dissolved in warm water. It may also be administered in liquid form by adding 4 parts of sodium nitrate, 13 parts of citric acid and a little water to 100 parts of sodium phosphate.

SODII PHOSPHAS EFFERVESCENS (SOD. PHOS. EFF.), EFFERVESCENT SODIUM PHOSPHATE, U. S. P.—A mixture of exsiccated sodium phosphate, sodium bicarbonate, tartaric acid and citric acid, representing approximately 50 per cent. of sodium phosphate as described above.

DOSAGE: 10 Gm. or 2½ drams.

Sodii Salicylas (Sod. Salicyl.), Sodium Salicylate, U. S. P.—Contains not less than 99.5 per cent. of $NaC_7H_5O_3$.

PROPERTIES: Sodium salicylate occurs as white microcrystalline powder or scales, or as an amorphous, white powder, having not more than a faint pink tinge, odorless, and having a sweet saline taste. It is very soluble in water (1: 0.9) and freely soluble in alcohol (1: 9.2).

INCOMPATIBILITIES: Sodium salicylate is incompatible with acids and acid salts and with solutions of most alkaloids, notably quinin, which precipitates as the salicylate. It gives a violet color to iron salts.

ACTIONS AND USES: Sodium salicylate is the salt which is usually employed to secure the constitutional effects of salicylic acid. It is slightly antiseptic, but not so much so as the free acid. It is irritant to mucous membranes, and may cause pain and even vomiting when large doses are administered on an empty stomach. Large therapeutic doses produce a ringing in the ears, nausea, sometimes vomiting, occasional sweating and an increase in the amount of urine. It increases nitrogenous metabolism, and an increased amount of uric acid is excreted in the urine. It stimulates the secretion of bile. In very large doses it may produce depression of the central nervous system, rarely convulsions, a slowing and depression of the respiration, and collapse from depression of circulation. Large doses may produce abortion, and hence the drug is contraindicated in pregnancy.

Sodium salicylate is an analgesic and is sometimes administered for the relief of headache or of neuralgic pains. It is chiefly used for its effect in articular rheumatism in which it is highly efficacious. It promptly relieves all the local joint symptoms and the fever, but does not affect the endocarditis. Its effects last only while the medication is kept up. It is useful in tonsillitis and other catarrhal inflammations, but has not the decided action in the ordinary infections that it has in rheumatic fever. It is used in chorea. It is of no value in gonorrheal arthritis and *arthritis deformans*, and of little value in gout.

It is useful in some forms of eye diseases, such as iritis, keratitis or glaucoma.

DOSAGE: 1 Gm. or 15 grains. The more efficient method is to repeat this dose every hour until salicylism occurs and then three times daily. It should be given in simple solution, but is sometimes administered in the form of powder inclosed in capsules or cachets, and followed by a sufficient amount of water to dilute it well in the stomach.

Sodii Sulphas (Sod. Sulph.), Sodium Sulphate, U. S. P. (Glauber's Salt).—Contains not less than 99 per cent. of $Na_2SO_4+10H_2O$.

PROPERTIES: Sodium sulphate occurs as large, colorless prisms or granular crystals, odorless and having a bitter saline taste. It is freely soluble in water (1: 2) and practically insoluble in alcohol.

ACTION AND USES: Sodium sulphate is used as a saline cathartic, but is less popular than magnesium sulphate or sodium phosphate.

DOSAGE: 15 Gm. or 4 drams.

Sodii Sulphis Exsiccatus (Sod. Sulphis Exsic.), Exsiccated Sodium Sulphite, U. S. P. (Replacing Sodii Sulphis, U. S. P., VIII).—Contains not less than 90 per cent. of Na_2SO_3.

PROPERTIES: Exsiccated sodium sulphite occurs as a white, odorless powder, having a cooling, saline, sulphurous taste. It is freely soluble in water (1: 3.2), but nearly insoluble in alcohol.

INCOMPATIBILITIES: It is incompatible with mineral acids.

ACTION AND USES: Exsiccated sodium sulphite is antiseptic and is principally used externally as a wash.

DOSAGE: It may be applied to the skin in parasitic skin diseases like scabies and favus in a solution of the strength of 1: 10 or 1 dram to the ounce. A similar solution may be used as a mouth wash in aphthous stomatitis, mucous patches, or ulcers of the tonsils.

Sodii Thiosulphas (Sod. Thiosulph.), Sodium Thiosulphate, U. S. P. (Sodium Hypophosphite).—Contains not less than 99 per cent. of $Na_2S_2O_3+5H_2O$.

PROPERTIES: Sodium thiosulphate occurs as colorless, transparent monoclinic prisms, odorless and having a cooling, afterward bitter taste. It is very soluble in water (1: 0.5) and practically insoluble in alcohol.

INCOMPATIBILITIES: Sodium thiosulphate is incompatible with acids, iodin and chlorin. It dissolves insoluble salts of silver.

ACTION AND USES: Sodium thiosulphate is used externally, in the form of a lotion, as an application for ringworm and other parasitic skin diseases. It is extensively *used in photography.* It may be used to remove stains of *iodin, silver* etc. Used internally, it is cath

DOSAGE: 1 Gm. or 15 grains. It may be used in aqueous solution or ointment of 10 per cent. strength or 1 dram to the ounce.

SPIRITUS, SPIRITS.—Spirits are alcoholic solutions of volatile substances; either gases, liquids or solids.

For preparations included in this list see:

SPIRITUS AETHERIS, under **Aether.**

SPIRITUS AETHERIS NITROSI, under **Aether Nitrosus.**

SPIRITUS AMMONIAE AROMATICUS, under **Ammonii Carbonas.**

SPIRITUS CAMPHORAE, under **Camphora.**

SPIRITUS CHLOROFORMI, under **Chloroformum.**

SPIRITUS GLYCERYLIS NITRATIS, under **Glycerylis Nitras.**

SPIRITUS MENTHAE PIPERITAE, under **Mentha Piperita.**

Stramonium (Stramon.), Stramonium, U. S. P. (Jamestown Weed, Jimson Weed).—The dried leaves of *Datura Stramonium* or of *Datura tatula.* Now seldom used in medicine except as an ingredient in so-called asthma powders for smoking. Its constituents and action are similar to those of belladonna.

Strophanthinum (Strophanthin.), Strophanthin, U. S. P.—A glucosid, or mixture of glucosids, obtained from strophanthus.

PROPERTIES: Strophanthin occurs as a white or faintly yellowish powder, having an intensely bitter taste. Because of its toxicity great caution should be used in tasting it. It is very soluble in water and in diluted alcohol, but less soluble in absolute alcohol.

ACTION AND USES: The actions of strophanthin are much like those of digitalis. It is excreted sooner and hence is regarded as preferable for administration in emergencies. It is not readily absorbed from the gastro-intestinal tract; hence its oral use is not recommended.

DOSAGE: 0.3 mg. or $\frac{1}{200}$ grain. It is best administered intramuscularly or intravenously, only a single dose being given daily, as a rule. The dose must be as large as 0.001 Gm. in many cases to prove effective.

The commercial strophanthins often contain varying amounts of ouabain (g-strophanthin or crystallized strophanthin), which is more active than the amorphous strophanthin. Caution should be exercised in using these preparations and especially in passing from the use of one preparation to that of another.

Strophanthus (Strophanth.), Strophanthus, U. S. P.—The ripe seed of *Strophanthus Kombé* or of *Strophanthus hispidus.* Occasionally administered in the form of powder. When extracted and assayed biologically the minimum lethal dose of strophanthus should not be greater than the equivalent of 0.0006 mg. for each gram of body weight of the frog.

ACTION AND USES: Strophanthus and tincture of strophanthus have properties similar to those of the glucosid strophanthin, though the therapeutic results from the administration of strophanthus by mouth are more variable than the results obtained from the hypodermic or intravenous administration of strophanthin.

TINCTURA STROPHANTHI (TR. STROPHANTH.), TINCTURE OF STROPHANTHUS, U. S. P.—One hundred Cc. represent 10 Gm. strophanthus in approximately 92 per cent. of alcohol. It is nearly identical with the international standard tincture of strophanthus. If assayed biologically the minimum lethal dose of tincture of strophanthus is not greater than 0.00006 Cc. for each gram of body weight of the frog.

DOSAGE: 0.5 Cc. or 8 minims. For intramuscular or intravenous injection a much smaller dose should be given, not more than 0.12 Cc. or 2 minims, as a rule.

Strychnina (Strych.), Strychnin, U. S. P.—An alkaloid, $C_{21}H_{22}O_2N_2$, obtained from nux vomica, and also obtainable from *Strychnos Ignatii*.

PROPERTIES: Strychnin occurs as colorless, transparent crystals or a white crystalline powder, odorless and having an intensely bitter taste. It is very slightly soluble in water (1: 6,420) and soluble in alcohol (1: 136).

INCOMPATIBILITIES: The salts of strychnin are incompatible with alkalies, alkali carbonates, iodids, bromids, arsenates and arsenites.

ACTION AND USES: Strychnin stimulates the reflex activity of the spinal cord, but produces little or no effect on the higher nervous centers. Large doses raise the blood-pressure by causing a constriction of the arterioles. It seems to have little direct effect on the heart. It stimulates the respiratory center, increasing the rapidity of the respirations. In poisonous doses it produces tonic convulsions similar to those of tetanus, but the trismus is less marked. Between the attacks there is usually complete relaxation of the affected muscles. The convulsions are spinal, but not cerebral in origin. Death may occur during a convulsion from fixation of the chest by spasm of the respiratory muscles or during the interval from medullary paralysis.

Strychnin is used as a bitter tonic, generally in the form of a preparation of nux vomica. It is also serviceable as a tonic to the muscular system. It has been widely used as a respiratory and circulatory stimulant in pneumonia and other infections, shock, etc., but careful observations have shown that non-toxic doses are ineffective.

Strychnin is serviceable in some forms of paralysis. It is of no value when the paralysis results from an organic lesion and should not be used in conditions of inflammation of the nerve centers. It may be employed in paralysis due to poisons, such as lead, and in postdiphtheric paralysis. It

is also of value in paralysis due to the cortical lesions, if used in moderate doses, to maintain the nutrition of the paralyzed muscles. In incontinence of urine, due to paresis of the vesical sphincter, it is useful, but if the incontinence depends on spasm atropin is more serviceable. Strychnin is useful in amblyopia, acting best in disturbance of vision unattended by changes visible with the ophthalmoscope, especially hysteric and neurasthenic forms. In lesions of the optic nerve it frequently produces an improvement in vision which, however, is only temporary. It is used in acute and chronic alcoholism. It is added to cathartics in the treatment of chronic constipation, but probably with little advantage.

DOSAGE: From 0.0005 Gm. (0.5 mg.) to 0.005 Gm. or from $\frac{1}{120}$ to $\frac{1}{12}$ grain, three times a day or even as often as once in three hours.

Strychninae Nitras (Strych. Nit.), Strychnin Nitrate, U. S. P.—The nitrate $C_{21}H_{22}O_2N_2.HNO_3$, of the alkaloid strychnin.

PROPERTIES: Strychnin nitrate occurs as colorless, needle-shaped crystals, odorless, and having an intensely bitter taste. It is soluble in water (1: 42) and slightly soluble in alcohol (1: 150).

DOSAGE: 0.0015 Gm. or $\frac{1}{40}$ grain.

Strychninae Sulphas (Strych. Sulph.), Strychnin Sulphate, U. S. P.—The sulphate, $(C_{21}H_{22}O_2N_2)_2H_2SO_4+5H_2O$, of the alkaloid strychnin.

PROPERTIES: Strychnin sulphate occurs as colorless or white prismatic crystals, or a white crystalline powder, odorless, and having an intensely bitter taste. Soluble in water (1: 32) and in alcohol (1: 81).

DOSAGE: 0.0015 Gm. or $\frac{1}{40}$ grain.

Sulphonal.—See under **Sulphonmethanum, U. S. P.**

Sulphonethylmethanum (Sulphonethylmeth.), Sulphonethylmethane, U. S. P. (Trional).—Diethylsulphone methyl ethyl methane, $(CH_3)(C_2H_5)C(SO_2C_2H_5)_2$.

PROPERTIES: Sulphonethylmethane occurs as colorless, odorless, crystalline scales, which have a bitter taste in aqueous solution. It is slightly soluble in water (1: 200) and freely soluble in alcohol.

ACTION AND USES: Sulphonethylmethane is a hypnotic, producing, in ordinary doses, no other symptoms than sleep. The sleep comes on in about an hour after the medicine is taken. In some cases the sleep is not secured until the next day.

Sulphonethylmethane, when repeatedly taken, may produce poisoning in which hematoporphyrin appears in the urine, giving it a pinkish tinge or red color. The continued use of the remedy may lead to the formation of a habit. In addition to the excretion of hematoporphyrin in the urine there are lassitude, weakness, nausea and gastrointestinal disturbance as shown by diarrhea and constipation. More serious symptoms then develop, including

abdominal tenderness, violent vomiting, ataxia, paresis of various muscles, loss of reflexes, and finally a condition of profound collapse. This condition ends in death in about 75 per cent. of the cases. There is a nephritis which involves the glomeruli and may be hemorrhagic in character.

Trional is of little use when the insomnia is accompanied by severe pain. It has been recommended also as an antispasmodic in epilepsy, hiccup, chorea, etc.

DOSAGE: 0.75 Gm. or 12 grains. Owing to its sparing solubility, it should be given with large quantities of hot liquids. It should not be used for more than two or three days consecutively. After this time recourse should be had to other hypnotics, if necessary. The appearance of hematoporphyrin, as indicated by pink color in the urine, should be watched for and the remedy suspended on its occurrence, but it is then often too late.

Sulphonmethanum (Sulphonmeth.), Sulphonmethane, U. S. P. (Sulphonal).—Diethylsulphone dimethyl methane, $(CH_3)_2C(SO_2C_2H_5)_2$.

PROPERTIES: Sulphonmethane occurs as colorless, inodorous and nearly tasteless crystals or a crystalline powder, slightly soluble in water (1: 365), but soluble in alcohol (1: 60).

ACTION AND USES: Sulphonmethane, or sulphonal, is hypnotic and sedative. See Sulphonethylmethane. It acts more slowly than trional and is best given about 5 p. m.

DOSAGE: 0.75 Gm. or 12 grains, given in a hot liquid.

Sulphur, Sulphur.—Official in the U. S. Pharmacopeia under three headings:

SULPHUR LOTUM (SULPH. LOT.), WASHED SULPHUR, U. S. P.

SULPHUR PRAECIPITATUM (SULPH. PRAEC.), PRECIPITATED SULPHUR, U. S. P.

SULPHUR SUBLIMATUM (SULPH. SUBLIM.), SUBLIMED SULPHUR, U. S. P.

PROPERTIES: Sulphur in any of the foregoing forms should contain from not less than 99.5 per cent. of pure sulphur. Sulphur occurs as a fine yellow powder, the sublimed variety having a slight odor and a faintly acid taste. The other varieties are without odor or taste and all are practically insoluble in water or in alcohol.

ACTION AND USES: Sulphur becomes active in the intestines and on the skin by a partial conversion into hydrogen sulphid or other sulphids. These products are antiseptic and irritant, so that sulphur becomes a mild purgative.

Sulphur is used externally as a parasiticide in cases of scabies. It is also used to produce sulphur dioxid for room disinfection by burning it in the proportion of 3 pounds of sulphur to each thousand cubic feet of air space. All surfaces and articles to be disinfected should be wet. Taken *internally, it acts* as a laxative.

DOSAGE: Each form, 4 Gm. or 60 grains.

UNGUENTUM SULPHURIS (UNG. SULPHUR.), SULPHUR OINTMENT, U. S. P.—A mixture of washed sulphur (15 Gm.) with benzoinated lard (85 Gm.).

SUPPOSITORIA, SUPPOSITORIES. — Suppositories are solid bodies intended to be introduced into the several natural orifices of the body for the purpose of producing systemic or local effects.

Suppositories are usually made with oil of theobroma as a base. Rectal suppositories should be cone-shaped and should weigh about 2 Gm. or 30 grains.

For the preparation included in this list see:

SUPPOSITORIA GLYCERINI, under **Glycerinum.**

L-Suprarenin Synthetic.—See **Epinephrin.**

SYRUPI, SYRUPS.—Syrups are strong solutions of sugar and water with or without the addition of active medicaments.

For preparations included in this list see:

SYRUPUS, under **Saccharum.**

SYRUPUS FERRI IODIDI, under **Ferri Iodidum.**

SYRUPUS IPECACUANHAE, under **Ipecacuanha.**

SYRUPUS PRUNI VIRGINIANAE, under **Prunus Virginiana.**

SYRUPUS RHEI AROMATICUS, under **Rheum.**

SYRUPUS SCILLAE, under **Scilla.**

SYRUPUS SENNAE, under **Senna.**

SYRUPUS TOLUTANUS, under **Balsamum Tolutanum.**

TABELLAE, TABLET-TRITURATES, COMPRESSED TABLETS.—Tablet-triturates are small disks made by diluting powdered medicaments with powdered sugar of milk or with powdered sugar, moistening the powder with sufficient alcohol to make a paste, and pressing into suitable molds. Compressed tablets are medicinal substances or mixtures of substances compressed to the form of disks.

Tannalbin.—See under **Acidum Tannicum.**

Terebinthina (Terebinth.), Turpentine, N. F.—A concrete oleoresin obtained from *Pinus palustris.* The source of:

OLEUM TEREBINTHINAE (OL. TEREB.), OIL OF TURPENTINE, U. S. P. (Turpentine Oil, "Spirits of Turpentine").—A volatile oil recently distilled from turpentine. Official in the Pharmacopeia also under the title Oleum Terebinthinae Rectificatus (Ol. Tereb. Rect.), Rectified Oil of Turpentine, U. S. P.

PROPERTIES: Oil of turpentine occurs as a thin colorless liquid, having a characteristic odor and taste, both of which become stronger and less pleasant by age and exposure to air. Oil of turpentine is practically insoluble in water, but freely soluble in alcohol (1:3), and in all proportions of oil.

ACTION AND USES: Oil of turpentine is antiseptic, anthelmintic and diuretic. Only the rectified oil should be used internally. Applied externally it is rubefacient and counter-irritant.

Oil of turpentine has been used as an expectorant in cases of bronchitis characterized by free secretion. For this purpose it is now generally replaced by terpin hydrate. It is also given for the relief of flatulence and a small amount (from ½ to 1 teaspoonful) may be added to enemas to increase their effectiveness.

Oil of turpentine has been thought to be efficient in cases of internal hemorrhages, but this opinion is not well founded.

DOSAGE: 0.3 Cc. or 5 minims (rectified oil). It may be administered in the form of emulsion or in capsules.

Terpini Hydras (Terpin. Hyd.), Terpin Hydrate, U. S. P.—The hydrate, $C_{10}H_{18}(OH)_2+H_2O$, of the diatomic alcohol terpin.

PROPERTIES: Terpin hydrate occurs as colorless, lustrous, rhombic prisms, nearly odorless, and having a slightly aromatic and somewhat bitter taste. It is slightly soluble in water (1: 200) and freely soluble in alcohol (1: 13).

ACTION AND USES: Terpin hydrate is antiseptic, diaphoretic and diuretic. It is largely used as an expectorant in cases accompanied by free bronchial secretion.

DOSAGE: 0.125 Gm. or 2 grains. Terpin hydrate may be administered in the form of powder or in capsules. As a solution, usually in the form of elixir, it requires an excessive amount of alcohol.

Tetanus Antitoxin.—See under **Serum Antitetanicum.**

Theobromatis Oleum (Ol. Theobrom.), Oil of Theobroma, U. S. P. (Oleum Theobromatis, Butter of Cacao, Cacao Butter).—A fixed oil expressed from the roasted seeds of *Theobroma cacao.*

PROPERTIES: Oil of theobroma occurs as a yellowish-white solid, having a faint, agreeable odor and a bland chocolate-like taste. It is freely soluble in ether, chloroform and benzene, soluble in absolute alcohol and insoluble in water.

ACTION AND USES: Oil of theobroma is used in pharmacy chiefly for the making of suppositories. Also used as a lubricant in massage, and as an application to sore nipples.

Theobromina (Theobrom.), Theobromin, N. N. R.—3,7-dimethyl-xanthin, a base occurring in *Theobroma cacao* and other drugs, and also made synthetically. It is closely related to caffein (1,3,7-trimethyl-xanthin).

PROPERTIES: Theobromin occurs as a white, crystalline powder, odorless, and having a bitter taste. It is very slightly soluble in water, but is soluble in alcohol (1: 100).

ACTION AND USES: Theobromin has actions on the kidneys and heart similar to those of caffein, but its effect on

the central nervous system is less marked. The relative freedom from side actions constitutes an advantage over caffein.

Theobromin is used as a diuretic in all forms of dropsy, but it is especially useful in renal dropsy. It is non-irritating to the kidney.

DOSAGE: 0.3 Gm. or 5 grains.

Theobrominae Sodio-Salicylas (Theobrom. Sodio-Sal.), Theobromin Sodium Salicylate, U. S. P. (Diuretin.—A double salt of theobromin-sodium and sodium salicylate in approximately molecular proportions.

PROPERTIES: Theobromin sodium salicylate contains 50 per cent. of theobromin and occurs as a white powder, odorless and having a saline taste. It is freely soluble in water (1: 1), but is readily decomposed on exposure to carbon dioxid or by the action of acids and must therefore be preserved in well-stoppered bottles.

INCOMPATIBILITIES: Theobromin sodium salicylate is incompatible with acids and has the other incompatibilities of salicylates.

DOSAGE: 1 Gm. or 15 grains, three times a day.

Theophyllina (Theophyll.), Theophylline, U. S. P.—A feebly basic alkaloid, isomeric with theobromine. It is found in small amounts in the leaves of *Thea sinensis* Linné and is also prepared synthetically.

PROPERTIES: Theophylline is dimethylxanthine. It occurs as a white, crystalline powder; odorless and having a bitter taste. It is permanent in the air.

ACTIONS AND USES: Theophylline is used in cardiac affections, edemas, nephritis, etc. It has a diuretic action similar to that of caffeine or theobromine, but is more powerful, and often succeeds where the other agents fail. However, the diuretic response is not as lasting; for this reason, it is advisable to replace it after 2 or 3 days by theobromine. Theophylline may produce gastric and perhaps renal irritation.

DOSAGE: 0.2 to 0.35 Gm. or 3 to 5 grains, three times daily in hot tea.

Thymol, Thymol, U. S. P.—A phenol, $C_6H_3(CH_3)(OH)(C_3H_7)$-1:3:4, occurring in the volatile oil of *Thymus vulgaris* and in some other volatile oils.

PROPERTIES: Thymol occurs as large, colorless prisms, having an aromatic, thyme-like odor, and a pungent, aromatic taste. It is only very slightly soluble in water (1: 1,010), but freely soluble in alcohol (1: 1).

ACTION AND USES: Thymol is antiseptic and anthelmintic. As an anthelmintic it is used chiefly for the destruction of hookworm.

DOSAGE: Antiseptic, 0.125 Gm. or 2 grains; anthelmintic, 1 Gm. or 15 grains.

In the treatment of hookworm disease it should be given in as finely divided state as possible in dosage of from 0.5 to 4 Gm. or from 8 to 60 grains. No fats, oils or alcohols should be given at the same time, for fear of facilitating the absorption of the drug.

The dosage may be regulated according to age as follows: Up to 5 years of age, 0.5 Gm.; up to 10, 1 Gm.; up to 15, 1.5 Gm.; up to 20, 2 Gm.; above 20, 3 to 4 Gm.

Thymolis Iodidum (Thymol. Iod.), Thymol Iodid, U. S. P. (Aristol).—Dithymol-di-iodid, $(C_6H_2.CH_3.C_3H_7.OI)_2$, obtained by the condensation of two molecules of thymol and the introduction of two atoms of iodin into the phenolic groups of the thymol.

PROPERTIES: Thymol iodid contains, when dried over sulphuric acid, not less than 43 per cent. of iodin. It occurs as a bright, chocolate-colored, or reddish-yellow, bulky powder, with a very slight aromatic odor. It is practically insoluble in water and nearly insoluble in alcohol.

ACTION AND USES: Thymol iodid, or aristol, is antiseptic and is used in place of iodoform, chiefly as a dusting-powder.

Thyroideum Siccum (Thyroid. Sicc.), Dried Thyroids, U. S. P. (Glandulae Thyroideae Siccae, U. S. P. VIII, Desiccated Thyroid Glands). The thyroid glands of animals which are used for food by man, freed from fat, and cleaned, dried and powdered.

PROPERTIES: Dried thyroids is a yellowish, amorphous powder, having a slight, characteristic odor, and containing the active constituent of the thyroid tissue. It is partially soluble in water. The preparation should be standardized to contain about 0.2 per cent. of iodin in organic combination.

ACTION AND USES: Dried thyroid gland acts chiefly if not entirely through a compound of iodin contained in it; the substance known commercially as "iodothyrin" seems sometimes, but not always, to represent the full activity of the gland. When given in therapeutically active doses thyroid causes an increase of the nitrogen of the urine and a decrease in weight; it usually increases the absorption of oxygen and the elimination of carbon dioxid. It is one of the very few drugs which can properly be called stimulants of metabolism. The loss of weight is due mainly to increased catabolism of adipose tissue, although there is also an increased breaking down of protein unless the diet contains an abundance of protein. With larger, or long-continued doses there is a very rapid action of the heart, nervousness, tremors, headache, flushing of the surface, sweating and much more pronounced loss of weight.

Thyroid gland is of service in cases marked by deficient action of the gland. The most striking results are obtained in cretinism and myxedema and in the condition known as *cachexia* thyreopriva, due to the removal of the thyroid gland. The beneficial effects are seen in the improved condition of the skin, the reestablishment of perspiration and

of a normal temperature, increased diuresis and loss of weight, improvement in the mental condition and, in young subjects, renewed growth, especially of the long bones and of the hair. In many cases after the more severe symptoms of hypothyroidism have disappeared, remarkably small doses suffice to keep the patient in an almost normal state; it is often necessary, however, to continue such small doses indefinitely.

Thyroid is efficacious in many cases of milder degrees of hypothyroidism; but these are often difficult to diagnose.

In some forms of goiter the function of the thyroid is defective and the administration of the dried gland is indicated; but in most cases of goiter its use is condemned. Thyroid has been much used in obesity, but it is indicated in only a small proportion of cases and it should be given in moderate amounts so as not to do harm by the destruction of proteins. The effects, which are marked at first, are not permanent. Thyroid gland has been used with reported success in various skin diseases, such as psoriasis and eczema, and also in certain cases of amenorrhea.

DOSAGE: 0.06 Gm. or 1 grain should be given as the initial dose three times daily, increasing gradually until improvement is noted; its administration should be discontinued if toxic symptoms appear. The patient should be careful of exertion and should take sufficient protein in his diet to compensate for increased loss of nitrogen from the action of the drug. The remedy may be given in powder, cachets or capsules. A dose of 0.6 Gm. or 10 grains should rarely be exceeded.

Tiglii Oleum (Ol. Tiglii), Croton Oil, U. S. P. (Oleum Tiglii).—A fixed oil expressed from the seeds of *Croton Tiglium.*

PROPERTIES: Croton oil occurs as a pale yellow or brownish-yellow, somewhat viscid, and slightly fluorescent liquid, having a slight, fatty odor, and a mild, oily, afterward acrid and burning taste. It is practically insoluble in water, but when fresh is soluble in alcohol.

ACTION AND USES: Croton oil is a drastic cathartic and applied externally is rubefacient and vesicant. It is used mostly to produce prompt evacuation of the bowels, especially in coma.

DOSAGE: 0.05 Cc. or 1 minim, given in olive oil, butter, etc. It may be placed on the tongue in granulated sugar if the patient cannot swallow.

TINCTURAE, TINCTURES.—Tinctures, with a few exceptions, are alcoholic or hydroalcoholic extractive preparations of vegetable drugs; the tinctures of potent drugs represent uniformly 10 Gm. of drug in 100 Cc. of the preparation, while tinctures of less potent drugs vary in strength, but represent usually 20 Gm.

For preparations included in this list see:

TINCTURA ACONITI, under **Aconitum.**

TINCTURA BELLADONNAE FOLIORUM, under **Belladonnae Folia.**

TINCTURA BENZOINI COMPOSITA, under **Benzoinum.**

TINCTURA CAPSICI, under **Capsicum.**

TINCTURA CARDAMOMI, under **Cardamomum.**

TINCTURA CINCHONAE, and TINCTURA CINCHONAE COMPOSITA, under **Cinchona.**

TINCTURA COLCHICI SEMINIS, under **Colchici Semen.**

TINCTURA DIGITALIS, under **Digitalis.**

TINCTURA FERRI CHLORIDI, under **Ferri Chloridum.**

TINCTURA GENTIANAE COMPOSITA, under **Gentiana.**

TINCTURA HYOSCYAMI, under **Hyoscyamus.**

TINCTURA IODI, under **Iodum.**

TINCTURA LOBELIAE, under **Lobelia.**

TINCTURA MYRRHAE, under **Myrrha.**

TINCTURA NUCIS VOMICAE, under **Nux Vomica.**

TINCTURA OPII, TINCTURA OPII CAMPHORATA, and TINCTURA OPII DEODORATI, under **Opium.**

TINCTURA RHEI AROMATICA, under **Rheum.**

TINCTURA SCILLAE, under **Scilla.**

TINCTURA STROPHANTHI, under **Strophanthus.**

TINCTURA VALERIANAE AMMONIATA, under **Valeriana.**

TINCTURA ZINGIBERIS, under **Zingiber.**

Tragacantha (Trag.), Tragacanth, U. S. P. (Gum Tragacanth).—A gummy exudation from *Astragalus gummifer.*

ACTION AND USES: Tragacanth swells on addition of water and gradually forms a cloudy gelatinous mass. On further addition of water it forms a mucilage which is occasionally used in pharmacy in the making of emulsions and is widely used as a basis for a greaseless catheter lubricant and an application for chapped skin.

Trinitrophenol (Trinitrophen.), Trinitrophenol, U. S. P. (Acidum Picricum, Picric Acid, U. S. P.—$C_6H_2.OH(NO_2)_3$(1:2:4:6). An acid obtained by nitrating phenol.

CAUTION: For safety in transportation it is usually mixed with 20 per cent. of water.

PROPERTIES: Trinitrophenol occurs as pale, yellow prisms, odorless and having a very bitter taste. It is explosive when heated rapidly or when subject to percussion. It is soluble in cold water (1:78), imparting a yellow color to a very large volume, more soluble in water at higher temperatures (1:25 at 80 C.), easily soluble in alcohol (1:12).

ACTION AND USES: Picric acid is an irritant, astringent *and antiseptic to* the skin and mucous membranes. Taken *internally it* may produce nausea, vomiting and diarrhea.

The urine is colored red or yellow and may show signs of nephritis. The skin and mucous membranes may be stained yellow and thus jaundice may be simulated. Red blood-cells are partly dissolved and the white cells are increased in number. It is said to be a very useful application for burns, but the application has been said to be painful in some instances, especially in children, by absorption through the skin.

Picric acid is used mainly for the treatment of superficial burns. Cloths are saturated with this solution and applied after proper cleansing of the burned area. Over this is placed a pad of dry absorbent cotton which is fastened by a light bandage. The dressing rapidly dries and may be left in place for several days. Caution should be used in applying this solution to large surfaces.

DOSAGE: From 0.03 to 0.1 Gm. (½ to 1½ grains). A solution containing 6 parts of picric acid, 60 parts of alcohol to 1,000 parts of water has been recommended for local application.

TRITURATIONES, TRITURATIONS.—Pharmacopeial triturations are active remedies diluted usually with 10 parts of sugar of milk.

Trional.—See under **Sulphonethylmethanum, U. S. P.**

TROSCHISCI, TROCHES.—Troches, or lozenges, are flat solid bodies intended to be dissolved in the mouth for their local effect on the mucous membrane of the mouth and the throat.

Tuberculinum, Tuberculin, N. N. R.—This represents the products of growth of the tubercle bacillus.

PROPERTIES: Tuberculin is marketed in a variety of forms, either as a filtered extract of the bacilli or as the pulverized insoluble substance of the dead bacilli themselves. In the latter or emulsified form tuberculin is known as tubercle vaccine, and it is closely related to bacterial vaccines mentioned under Vaccina.

ACTION AND USES: Tuberculin is used principally as a diagnostic agent and the characteristic properties of the trade product to be used should be studied closely before it is employed.

UNGUENTA, OINTMENTS.—Ointments are soft, fatty solids of such consistency that they are readily spread at ordinary temperatures. When intended for systemic effect they are applied by inunction; ordinarily they are used as simple protectives.

For preparations included in this list see:

UNGUENTUM ACIDI BORICI, under **Acidum Boricum.**

UNGUENTUM BELLADONNAE, under **Belladonnae Folia.**

UNGUENTUM CHRYSAROBINI, under **Chrysarobinum.**

UNGUENTUM HYDRARGYRI, and UNGUENTUM HYDRARGYRI DILUTUM, under **Hydrargyrum.**

UNGUENTUM HYDRARGYRI AMMONIATI, under **Hydrargyrum Ammoniatum.**

UNGUENTUM HYDRARGYRI OXIDI FLAVI, under **Hydrargyri Oxidum Flavum.**

UNGUENTUM PICIS LIQUIDAE, under **Pix Liquida.**

UNGUENTUM SULPHURIS, under **Sulphur.**

UNGUENTUM ZINCI OXIDI, under **Zinci Oxidum.**

Urotropin.—See under **Hexamethylenamina.**

VACCINA, BACTERIAL VACCINES, N. N. R.—Bacterial vaccines are suspensions of the killed bacteria in physiologic salt solution. Cresol is usually added as a preservative.

Bacterial vaccines are used to secure the production of an active immunity. Great care and skill are necessary for their proper use, and no definite statements as to dosage, etc., can be given.

The use of most of these vaccines is in the experimental stage. They are often prepared from cultures obtained from the individual to be treated (autogenous vaccines); these usually give the best results, and some authors maintain that "stock" vaccines should be used only when it is impracticable to secure the autogenous agent.

Vaccine Virus.—See under **Virus Vaccinicum.**

Vaccinum Staphylococcicum (Vac. Staphylococ.), Staphylococcus Vaccine, N. N. R.—A vaccine made from the *Staphylococcus pyogenes aureus,* from the *Staphylococcus pyogenes albus,* or from the *Staphylococcus pyogenes citreus,* or from all three.

ACTION AND USES: Staphylococcus vaccine is thought to be useful in carbunculosis, furunculosis, sycosis, and certain cases of acne. Probably an autogenous vaccine may be used. The forms of acne most likely to respond are characterized by deep-seated pustules, with considerable induration, situated on the face, chest and back. When the lesions are superficial and indolent, the acne vaccines give good results, and when there is a mixture of active and indolent lesions, a mixture of the two vaccines is indicated.

Vaccinum Typhosum (Vac. Typhos.), Typhoid Vaccine, N. N. R.—A vaccine made from *Bacillus typhosus.* In some cases *Bacillus paratyphosus* A and *Bacillus paratyphosus* B are also used.

ACTION AND USES: Typhoid vaccine is of recognized *utility in the* prevention of typhoid fever. The immunity *probably persists* in the majority of cases from two to four

years or longer. The vaccine may be of service also in the treatment of typhoid carriers. In such cases an autogenous vaccine is to be preferred. The same is true in the bacterial complications and sequelae of typhoid fever, especially those that appear during convalescence or are prolonged into that stage.

The use of vaccine in the treatment of typhoid fever has given very inconclusive results. No positive evidence of harm resulting from its use has been recorded. Many clinicians, however, believe that the giving of an additional amount of the toxin of the disease may turn the balance against recovery in states characterized by marked toxemia.

DOSAGE: As a preventive typhoid vaccine should be administered only to healthy persons. The skin should be sterilized with iodin and an initial dose of 500,000,000 bacteria injected aseptically. This injection should be followed in from seven to ten days by a second dose of 1,000,000,000 bacteria and a third injection of the same size is given seven to ten days after the second.

Valeriana (Valer.), Valerian, U. S. P.—The dried rhizome and roots of *Valeriana officinalis.*

ACTION AND USES: Valerian is thought to be antispasmodic and nerve sedative, but its influence is largely psychic, and in the ammoniated tincture the stimulating effects of the aromatic spirit of ammonia no doubt predominate.

TINCTURA VALERIANAE AMMONIATA (TR. VALER. AMMON.), AMMONIATED TINCTURE OF VALERIAN, U. S. P.—One hundred Cc. represent the soluble constituents of 20 Gm. of valerian in aromatic spirit of ammonia.

DOSAGE: 2 Cc. or 30 minims.

Veronal, Veronal, N. N. R. (Diethyl-Barbituric Acid, Diethyl Malonyl Urea, Malourea).—2,4,6-Trioxy-5-diethyl pyrimidin, a ureid derived from diethylmalonic acid.

Properties: Veronal occurs as a white, crystalline powder, odorless, and having a faint bitter taste. It is slightly soluble in water (1: 150) and freely soluble in alcohol (1: 8).

ACTION AND USES: Veronal is quickly absorbed, especially when it is given in solution. In smaller doses it induces sleep, apparently without any other effect. It is a rather slow-acting hypnotic, the hypnotic action beginning in about half an hour after its administration. In larger doses the temperature falls and animals show marked trembling and restlessness in their sleep. A number of fatalities have followed its indiscriminate use.

DOSAGE: 0.3 to 0.6 Gm. or 5 to 10 grains. Pills or tablets should be crushed before swallowing to insure absorption.

Sodii Diaethyl-Barbituras, Sodium Diethyl-Barbiturate, N. N. R.—Also known as veronal-sodium, is the monosodium salt of diethyl-barbituric acid.

Properties: Sodium diethyl-barbiturate occurs as a white, crystalline powder, odorless, and having an objectionably bitter alkaline taste. It is freely soluble in water (1: 5).

Action and Uses: Sodium diethyl-barbiturate, veronal-sodium or medinal has the same properties as veronal, but is more soluble.

Dosage: 0.3 to 0.6 Gm. or 5 to 10 grains.

VINA, WINES.—Medicated wines are solutions of active medicaments in wine or extractive preparations of vegetable drugs made with wine as a menstruum. Because of the great variation in the composition of wine it is unsatisfactory as a menstruum for extracting vegetable drugs, and medicated wines are in fact becoming obsolete.

For the wine included in this list see:

Vinum Antimonii, see under **Antimonii et Potassii Tartras.**

Virus Vaccinicum (Virus Vaccin.), Vaccine Virus, U. S. P. (Glycerinated Vaccine Virus, Smallpox Vaccine, Jennerian Vaccine).—The material obtained from skin eruptions of calves having vaccinia. The material is removed and prepared under aseptic conditions. The "pulp" is ground and mixed with varying percentages of glycerin. It is usually marketed in capillary tubes or as glycerinated points. Only such vaccine may be sold as has been prepared in establishments licensed by the Secretary of the Treasury of the United States.

Action and Uses: Vaccine virus is used as prophylactic against smallpox.

Zinci Acetas (Zinc. Acet.), Zinc Acetate, U. S. P.—Corresponds to not less than 99.5 per cent. of $Zn(C_2H_3O_2)_2+H_2O$.

Properties: Zinc acetate occurs as soft, white, pearly crystals, having a faintly acetous odor, and in dilute solutions an astringent, metallic taste. It is freely soluble in water (1: 2.3) and soluble in alcohol (1: 30).

Incompatibilities: Zinc acetate is incompatible with alkali carbonates or sodium borate.

Action and Uses: Zinc acetate is astringent and antiseptic. It is used principally in the form of solution as an external application, for injection, solution or collyria; rarely used internally.

Dosage: 0.125 Gm. or 2 grains.

It may be used in collyria in the proportion of from 0.1 to 0.5 per cent. or from ½ to 2 grains per ounce.

***Zinci Chloridum* (Zinc. Chlor.), Zinc Chlorid, U. S. P.**—*Contains not* less than 95 per cent. of $ZnCl_2$.

PROPERTIES: Zinc chlorid occurs as a white or nearly white granular powder or in porcelain-like masses, irregular or molded into pencils, odorless, and of such intensely caustic properties as to make tasting dangerous, unless freely diluted with water. The dilute solution has an astringent metallic taste. It is very soluble in water (1: 0.25) and in alcohol (1: 1.3).

INCOMPATIBILITIES: Zinc chlorid is incompatible with sodium borate and with alkali carbonates.

ACTION AND USES: Zinc chlorid is used as an antiseptic, astringent and escharotic.

LIQUOR ZINCI CHLORIDI (LIQ. ZINC. CHLOR.), SOLUTION OF ZINC CHLORID, U. S. P.—An aqueous solution containing about 50 per cent., by weight, of zinc chlorid made by dissolving granulated zinc in hydrochloric acid.

Zinci Oxidum (Zinc. Oxid.), Zinc Oxid, U. S. P.—Contains not less than 99 per cent. of ZnO.

PROPERTIES: Zinc oxid occurs as a very fine, amorphous, white or yellowish-white powder, free from gritty particles, without odor or taste. It is practically insoluble in water and in alcohol.

INCOMPATIBILITIES: Zinc oxid is incompatible with acids.

ACTION AND USES: Zinc oxid is antiseptic and astringent and is widely used either alone or in combination with boric acid, bismuth subnitrate and starch as a dusting-powder and as a sedative in ointment for a variety of skin diseases. By some it is thought to be a nervine, but this is probably incorrect. It is now rarely used internally.

UNGUENTUM ZINCI OXIDI (UNG. ZINC. OX.), OINTMENT OF ZINC OXID (Zinc Ointment).—A mixture of zinc oxid (20 Gm.) with benzoinated lard (80 Gm.).

Zinci Stearas (Zinc. Stear.), Zinc Stearate, U. S. P.—A compound of zinc with stearic acid and small but variable proportions of palmitic acid. Contains about 15 per cent. of ZnO.

PROPERTIES: Zinc stearate occurs as a very fine, white powder, tasteless, and having a very faint odor, resembling that of fat. It is practically insoluble in water and alcohol.

ACTION AND USES: Zinc stearate is used as a dusting powder, but appears to have little or no advantage over zinc oxid.

Zinci Sulphas (Zinc. Sulph.), Zinc Sulphate, U. S. P.—Corresponds to not less than 99.5 per cent. of $ZnSO_4+7H_2O$.

PROPERTIES: Zinc sulphate occurs as colorless, transparent, rhombic crystals, or granular crystalline powder, without odor, and having an astringent, metallic taste. It is very soluble in water (1: 0.6), but practically insoluble in alcohol.

INCOMPATIBILITIES: Alkali carbonates, sodium borate, tannin and vegetable astringents.

ACTION AND USES: Zinc sulphate is astringent, styptic and emetic. It is much used in collyria in conjunctivitis

and is especially effective in that form caused by **Morax-Axenfeld** bacillus. It is employed as an injection in the treatment of the chronic stages of gonorrhea.

DOSAGE: As an emetic, 1 Gm. or 15 grains.

In collyria it may be used in the strength of from 0.1 to 1.0 per cent. or from 1 to 5 grains per ounce. As an injection in gonorrhea solutions varying in strength from 0.5 to 4 per cent. may be used.

Zingiber (Zingib.), Ginger, U. S. P.—The dried rhizome of *Zingiber officinale*. Occasionally administered in the form of powder.

ACTION AND USES: Ginger is aromatic, stimulant and a stomachic tonic. It is a serviceable carminative in colic.

DOSAGE: 1 Gm. or 15 grains.

TINCTURA ZINGIBERIS (TR. ZINGIB.), TINCTURE OF GINGER, U. S. P. (Tincture of Jamaica Ginger).—One hundred Cc. represent the soluble constituents of 20 Gm. ginger in alcohol.

DOSAGE: 2 Cc. or 30 minims.

TABLE SHOWING THE RECORDED SOLUBILITY OF SUBSTANCES INCLUDED IN THE LIST OF USEFUL DRUGS

Abbreviations and signs used:

dec. = decomposed; ins. = insoluble; 00 — nearly insoluble or very slightly soluble; sol. = soluble; part. s. = partly soluble; v. s. = very soluble; misc. = miscible in all proportions; — — = unrecorded or uncertain.

The solubility values are for distilled water at approximately 25 C. and for the official U. S. P. alcohol at the same temperature and indicate the number of parts by measure of the solvent required to dissolve 1 part by weight of the substance.

Substance	Soluble in Parts of Cold Water	Parts of Cold Alcohol
Acacia, U. S. P.	2	ins.
Acetanilidum, U. S. P.	19	3.4
Acetphenetidinum, U. S. P.	310	15
Acidum Aceticum, U. S. P.	misc.	misc.
Acidum Benzoicum, U. S. P.	275	2.3
Acidum Boricum, U. S. P.	18	18
Acidum Citricum, U. S. P.	0.5	18
Acidum Hydrochloridum, U. S. P.	misc.	....
Acidum Hydrocyanicum Dilutum, U. S. P.	misc.	misc.
Acidum Nitricum, U. S. P.	misc.	— —
Acidum Phenylcinchonicum, U. S. P.	ins.	....
Acidum Salicylicum, U. S. P.	460	2.7
Acidum Tannicum, U. S. P.	v. s.	v. s.
Aether, U. S. P.	12	misc.
Aethyl-Morphinae Hydrochloridum, U. S. P.	8	22
Alcohol, U. S. P.	misc.	....
Alumen, U. S. P.	7.2	ins.
Ammonia	v. s.	v. s.
Ammonii Carbonas, U. S. P.	4	part. s.
Ammonii Chloridum, U. S. P.	2.6	100
Amylis Nitris, U. S. P.	ins.	misc.
Antimonii et Potassii Tartras, U. S. P.	12	ins.
Antipyrina, U. S. P.	v. s.	1.3
Apomorphinae Hydrochloridum, U. S. P.	50	50
Argenti Nitras, U. S. P.	0.4	30
Argenti Proteinas, N. N. R.	2	— —
Arseni Trioxidum, U. S. P.	30-100	ins.
Asafoetida, U. S. P.	part. s.	part. s.
Aspirinum, N. N. R.	100	v. s.
Atropina, U. S. P.	445	2
Atropinae Sulphas, U. S. P.	0.4	5
Balsamum Tolutanum, U. S. P.	ins.	v. s.
Benzoinum, U. S. P.	ins.	sol.
Benzosulphinidum, U. S. P.	290	31
Betanaphthol, U. S. P.	1,000	0.8
Bismuthi Subcarbonas, U. S. P.	ins.	ins.
Bismuthi Subgallas, U. S. P.	ins.	ins.
Bismuthi Subnitras, U. S. P.	ins.	ins.
Bismuthi Subsalicylas, U. S. P.	ins.	ins.
Caffeina, U. S. P.	46	66
Caffeinae Sodio-Benzoas, U. S. P.	1	30
Calcii Chloridum, U. S. P.	12	10
Calcii Lactas, N. N. R.	20	00
Calx, U. S. P.	840	ins.
Calx *Chlorinata*, U. S. P.	part s.	part. s.

Substance	Soluble in Parts of Cold Water	Parts of Cold Alcohol
Camphora, U. S. P.	00	v. s.
Caryophylli Oleum, U. S. P.	ins.	v. s.
Chloralum Hydratum, U. S. P.	0.25	1.3
Chloroform, U. S. P.	210	misc.
Chromii Trioxidum, U. S. P.	0.6	dec.
Chrysarobinum, U. S. P.	00	385
Cocaina, U. S. P.	600	6.5
Cocainae Hydrochloridum	0.4	3.2
Codeina, U. S. P.	120	2
Codeinae Sulphas, U. S. P.	30	1,380
Copaiba, U. S. P.	ins.	part. s.
Creosotum, U. S. P.	8	misc.
Cresol, U. S. P.	50	misc.
Cupri Sulphas, U. S. P.	2.5	500
Elaterinum, U. S. P.	ins.	325
Emetinae Hydrochloridum, U. S. P.	v. s.	v. s.
Eucalyptol, U. S. P.	00	v. s.
Ferri Chloridum, U. S. P.	misc.	misc.
Ferri et Ammonii Citras, U. S. P.	v. s.	ins.
Ferri Phosphas, U. S. P.	v. s.	ins.
Ferri Sulphas, U. S. P.	4	ins.
Ferrum Reductum, U. S. P.	ins.	ins.
Formaldehydi, Liquor U. S. P.	misc.	misc.
Gelatinum, U. S. P.	ins.	ins.
Glycerinum, U. S. P.	misc.	misc.
Glycerylis Nitratis, Spiritus, U. S. P.	ins.	v. s.
Guaiacol, U. S. P.	53	misc.
Hexamethylenamina	1.5	12.5
Homatropinae Hydrobromidum, U. S. P.	6	40
Hydrargyri Chloridum Corrosivum, U.S.P.	13.5	3.8
Hydrargyri Chloridum Mite, U. S. P.	ins.	ins.
Phenolphthaleinum, N. N. R.	ins.	ins.
Hydrargyri Iodidum Rubrum, U. S. P.	misc.	misc.
Hydrargyri Oxidum Flavum, U. S. P.	ins.	ins.
Hydrargyri Salicylas, U. S. P.	ins.	ins.
Hypophysis Sicca, U. S. P.	part. s.	....
Ichthyol, N. N. R.	misc.	part. s.
Iodoformum, U. S. P.	10,000	60
Iodum, U. S. P.	2,950	10
Linum, U. S. P.	ins.	00
Magnesii Carbonas, U. S. P.	ins.	ins.
Magnesii Oxidum, U. S. P.	ins.	ins.
Magnesii Sulphas, U. S. P.	1	ins.
Menthol, U. S. P.	00	v. s.
Methylis Salicylas, U. S. P.	ins.	misc.
Morphina, U. S. P.	3,340	210
Morphinae Hydrochloridum, U. S. P.	175	52
Morphinae Sulphas, U. S. P.	15.5	565
Oxygenium, N. N. R.	34	3.6
Pancreatinum, U. S. P.	part. s.	ins.
Paraffinum, U. S. P.	ins.	ins.
Paraldehydum, U. S. P.	8	misc.
Pelletierinae Tannas, U. S. P.	240	16
Pepsinum, U. S. P.	....	ins.
Petrolatum Liquidum, U. S. P.	ins.	ins.
Phenol, U. S. P.	15	misc.
Phenolphthaleinum, U. S. P.	ins.	13
Phenylis Salicylas, U. S. P.	6,670	6
Phosphorus	ins.	350
Physostigminae Salicylas, U. S. P.	75	16
Pilocarpinae Hydrochloridum, U. S. P.	0.3	3
Pix Liquida, U. S. P.	part. s.	misc.
Pilocarpinae Nitras, U. S. P.	4	75
Plumbi Acetas, U. S. P.	1.4	38
Potassii Acetas, U. S. P.	0.5	2.9
Potassii Bicarbonas, U. S. P.	2.8	ins.
Potassii Bromidum, U. S. P.	1.5	250
Potassii Carbonas, U. S. P.	0.9	ins.

Substance	Soluble in Parts of Cold Water	Parts of Cold Alcohol
Potassii Chloras, U. S. P.	**11.5**	**ins.**
Potassii Citras, U. S. P.	**0.6**	**ins.**
Potassii et Sodii Tartras, U. S. P.	0.9	ins.
Potassii Hydroxidum, U. S. P.	0.9	3
Potassii Iodidum, U. S. P.	0.7	22
Potassii Permanganas, U. S. P.	13.5	dec.
Protargol, N. N. R.	2	....
Quinina, U. S. P.	1,560	0.8
Quininae Bisulphas, U. S. P.	8.5	18
Quininae Hydrochloridum, U. S. P.	18	0.8
Quininae Sulphas, U. S. P.	725	107
Quininae Tannas, U. S. P.	00	3
Quininae et Ureae Hydrochloridum, U. S. P.	0.9	2.4
Resorcinol, U. S. P.	0.9	0.9
Ricini Oleum, U. S. P.	ins.	1
Saccharum, U. S. P.	0.5	170
Saccharum Lactis, U. S. P.	4.9	ins.
Salvarsan, N. N. R.	sol.	....
Santali Oleum, U. S. P.	ins.	sol.
Santoninum, U. S. P.	5,300	43
Sapo, U. S. P.	sol.	sol.
Sapo Mollis, U. S. P.	....	sol.
Scopolaminae Hydrobromidum, U. S. P.	1.5	20
Oleum Sinapis Volatile, U. S. P.	00	misc.
Sodii Arsanilas, N. N. R.	6	....
Sodii Arsenas, U. S. P.	5	ins.
Sodii Benzoas, U. S. P.	1.8	61
Sodii Bicarbonas, U. S. P.	10	....
Sodii Biphosphas, N. N. R.	v. s.	ins.
Sodii Bromidum, U. S. P.	1	16
Sodii Cacodylas, U. S. P.	0.5	2.5
Sodii Carbonas Monohydratus, U. S. P.	3	ins.
Sodii Chloridum, U. S. P.	2.8	ins.
Sodii Hydroxidum, U. S. P.	0.9	v. s.
Sodii Iodidum, U. S. P.	0.5	3
Sodii Nitris, U. S. P.	1.5	ins.
Sodii Phosphas, U. S. P.	5.5	ins.
Sodii Salicylas, U. S. P.	0.9	9.2
Sodii Sulphas, U. S. P.	2	ins.
Sodii Thiosulphas, U. S. P.	0.5	ins.
Strophanthinum, U. S. P.	v. s.	v. s.
Strychnina, U. S. P.	6,420	136
Strychninae Nitras, U. S. P.	42	150
Strychninae Sulphas, U. S. P.	32	81
Sulphonethylmethanum, U. S. P.	200	v. s.
Sulphonmethanum, U. S. P.	365	60
Sulphur, U. S. P.	ins.	ins.
Terebinthina, N. F.	ins.	3
Terpini Hydras, U. S. P.	200	13
Theobromatis Oleum, U. S. P.	ins.	sol.
Theobromina, N. N. R.	ins.	100
Theobrominae Sodio-Salicylas, U. S. P.	1	....
Theophyllina, U. S. P.	100	80
Thymol, U. S. P.	1,010	1
Thymolis Iodidum, U. S. P.	ins.	ins.
Thyroideum Siccum, U. S. P.	part. s.	....
Tiglii Oleum, U. S. P.	ins.	sol.
Trinitrophenol, U. S. P.	78	12
Veronal, N. N. R.	150	8
Veronal Sodium, N. N. R.	5	....
Zinci Acetas, U. S. P.	2.3	30
Zinci Chloridum, U. S. P.	0.25	1.3
Zinci Oxidum, U. S. P.	ins.	ins.
Zinci Stearas, U. S. P.	ins.	ins.
Zinci Sulphas, U. S. P.	0.6	ins.

PHARMACOLOGIC INDEX

The following classification of articles included in the list of useful drugs according to their therapeutic use has been adapted from the sixth edition of a text-book on pharmacology and therapeutics by Arthur R. Cushny. This index serves to indicate the comprehensiveness of the list and should assist in suggesting to practitioners and teachers possible additions and deletions that might be made so that the list will include all of the thoroughly well-established remedies that are really of use.

For ready reference the titles used are those under which the drug or preparation has been included and described in the list of useful remedies.

I. Drugs Applied for Their Local Action to the Skin, Wounds or Visible Mucous Membranes

Corrosives or Caustics:

Acidum Aceticum
Acidum Nitricum
Alumen Exsiccatum
Argenti Nitras
Arseni Trioxidum
Chromii Trioxidum
Hydrargyrum Ammoniatum
Iodum
Phenol
Potassii Carbonas
Potassii Hydroxidum
Sodii Carbonas
Sodii Hydroxidum
Zinci Chloridum

Disinfectants and Antiseptics:

Acidum Benzoicum
Acidum Boricum
Acidum Salicylicum
Argenti Nitras
Calx
Calx Chlorinata
Camphora
Cresol
Eucalyptol
Formaldehydi, Liquor
Hydrargyri Chloridum Corrosivum
Hydrargyri Iodidum Rubrum
Hydrogenii Dioxidi, Liquor
Iodoformum
Iodum
Olea Volatilia
Phenol
Pix Liquida
Potassii Permanganas
Sulphur
Thymol
Zinci Chloridum

Astringents:

Acidum Tannicum
Alcohol
Alumen
Alumini Acetatis, Liquor

Argenti Nitras
Bismuthi Subcarbonas
Bismuthi Subgallas
Bismuthi Subnitras
Cupri Sulphas
Ferri Chloridum
Ferri Sulphas
Plumbi Acetas
Zinci Acetas
Zinci Oxidum
Zinci Sulphas

Styptics:

See also Soluble Astringents
Ferri Chloridum
Alumen Exsiccatum

To Contract Vessels and Reduce Hemorrhage and Swelling:

Epinephrina

Emollients: Powders:

Amylum
Bismuthi Subcarbonas
Bismuthi Subnitras
Magnesii Carbonas
Talcum
Zinci Oxidum

Protectives:

Adeps
Adeps Lanæ
Cera
Collodion
Olea Pingua
Petrolatum

Local Anodynes and Analgesics for Pain and Itching:

Aconitum
Ammoniæ, Aqua
Atropina
Chloroformum
Cocaina
Cocaina Hydrochloridum
Phenol
Sodii Bicarbonas

Local Anesthetics:

Æther
Æthylis Chloridum
Cocaina
Cocainae Hydrochloridum
Menthol
Novocain
Quininae et Ureae Hydrochloridum

II. Drugs Used for Affections of the Alimentary Tract

Mouth and Throat. (*See also Section 1*):

Demulcent:

Acacia
Ammonii Chloridum
Glycerinum
Potassii Chloras

To Lessen Salivation:

Atropina

Flavoring Substances:

Acidum Citricum
Olea Volatilia

Saccharum
Syrupi
Syrupus
Syrupus Pruni Virginianæ
Syrupus Tolutanus

Stomach:

Digestives:
Acidum Hydrochloricum
Pepsinum

Emetics:
Antimonii et Potassii Tartras
Apomorphinæ Hydrochloridum
Cupri Sulphas
Emetinæ Hydrochloridum
Ipecacuanha
Sinapis
Sodii Chloridum
Zinci Sulphas

To Lessen Irritation and Vomiting:
Bismuthi Subcarbonas
Bismuthi Subnitras
Chloralum Hydratum
Chloroformum
Cocaina
Cocainae Hydrochloridum
Codeina
Codeinae Sulphas
Liquor Calcis
Menthol
Morphina
Morphinae Sulphas
Opium

To Lessen Acidity, Antacids:
Calcii Carbonas
Calx (Liquor Calcis)
Magnesii Carbonas
Magnesii Oxidum
Sodii Bicarbonas

To Increase Secretion, Bitters:
Cinchona
Gentiana
Nux Vomica
Quinina
Quininae Sulphas
Strychnina
Strychninae Sulphas

Carminatives:
See also Bitters.
Alcohol
Camphora
Capsicum
Cardamomum
Caryophyllus
Myrrha
Olea Volatilia
Sinapis
Zingiber

Intestine:

To Promote Digestion:
Pancreatinum (?)

To Promote Evacuation, Purgatives:
- Vegetable Purgatives:
  - Aloe
  - Aloinum
  - Colocynthis
  - Elaterinum
  - Jalapa
  - Podophyllum
  - Rhamnus Purshiana
  - Rheum
  - Ricini, Oleum
  - Senna
  - Tiglii, Oleum
- Saline Purgatives:
  - Magnesii Carbonas
  - Magnesii Citratis, Liquor
  - Magnesii Oxidum
  - Magnesii Sulphas
  - Potassii Bitartras
  - Potassii Citras
  - Potassii et Sodii Tartras
  - Sodii Phosphas
  - Sodii Sulphas
- Mercurial Purgatives:
  - Hydrargyri Chloridum Mite
- Hydrargyrum cum Creta
- Miscellaneous:
  - Fel Bovis
  - Glycerinum
  - Sulphur

To Lessen Movement and Relax Spasm:
- Acidum Tannicum
- Argenti Nitras
- Atropina
- Belladonna
- Bismuthi Subcarbonas
- Bismuthi Subgallas
- Bismuthi Subnitras
- Calx (Liquor Calcis)
- Morphina
- Morphinae Sulphas
- Opium
- Plumbi Acetas

To Destroy Parasites, Anthelmintics:
- Aspidium
- Chloroformum
- Hydrargyri Chloridum Mite
- Pelletierinæ Tannas
- Phenylis Salicylas
- Santoninum
- Terebinthinæ, Oleum
- Thymol

Disinfectants and Antiseptics:
- See also, Vegetable, Saline and Mercurial Purgatives.
- Phenylis Salicylas

III. Drugs Used for Their Effects on the Circulation

Heart:

To Strengthen Contraction:
- Digitalis
- Strophanthinum
- Strophanthus

To Accelerate Pulse:
- Atropina
- *Caffeina*

To Slow Pulse:
Aconitum
Digitalis
Strophanthinum
Strophanthus

Vessels:

To Contract Caliber and Raise Blood-Pressure:
Epinephrina
Ergota
Hypophysis

To Relax Vessels and Lower Blood-Pressure:
Amylis Nitris
Glycerylis Nitratis, Spiritus
Sodii Nitris

To Arrest Internal Hemorrhage, Styptics:
Hydrastis
Morphina, Opium } To allay restlessness

To Remove Fluid (Dropsy, Anasarca):
See also Diuretics (Kidney), Diaphoretics (Skin), Vegetable and Saline Purgatives (Intestine)
Digitalis
Hydrargyri Chloridum Mite.
Scilla
Strophanthinum
Strophanthus

IV. Drugs Used for Their Effects on the Genito-Urinary System

To Increase the Flow of Urine (Diuretics):
Ætheris Nitrosi, Spiritus
Ammonii Acetatis, Liquor
Caffeina
Cubeba
Digitalis
Hydrargyri Chloridum Mite
Potassii Acetas
Potassii Citras
Potassii Nitras
Santali, Oleum
Scilla
Sodii Nitris
Sparteinæ Sulphas
Strophanthinum
Strophanthus
Theobromina
Theophyllina

To Render the Urine Less Acid:
Potassii Acetas
Potassii Bicarbonas
Potassii Citras
Sodii Bicarbonas
Sodii Carbonas

To Render the Urine More Acid:
Sodii Biphosphas
Mineral Acids

To Render the Urine Antiseptic:
Acidum Benzoicum
Acidum Salicylicum
Aspirin
Hexamethylenamina
Phenylis Salicylas
Santali Oleum
Sodii Benzoas

Sodii Boras
Sodii Salicylas
Local antiseptics, etc.

To Promote Menstruation, Emmenagogues:

See also Vegetable Purgatives.
Aloe
Aloinum
Myrrha

V. Drugs Used for Their Effects on the Respiratory System

To Stimulate the Respiratory Center:

Atropina
Caffeina
Camphora
Strychnina
Strychninae Sulphas

To Reduce the Irritability of the Center in Cough:

Chloralum Hydratum
Chloroformum
Codeina
Codeinae Sulphas
Morphina
Morphinae Sulphas
Opium

To Increase and Liquefy the Bronchial Secretion:

Ammonii Carbonas.
Antimonii et Potassii Tartras
Apomorphinæ Hydrochloridum
Ipecacuanha
Potassii Iodidum
Scilla
Sodii Iodidum

To Lessen the Secretion of the Bronchi (?):

Benzoinum
Terpini Hydras

To Relax Bronchial Spasm in Asthma:

Amylis Nitris
Atropina
Belladonna
Glycerylis Nitratis, Spiritus
Potassii Iodidum
Sodii Iodidum
Sodii Nitris

VI. Drugs Used for Their Effects on the Central Nervous Syste

Stimulants:

(a) The spinal cord:
Strychnina
Strychninae Sulphas
(b) The brain and medulla oblongata:
Atropina
Atropinae Sulphas
Caffeina

Depressants:

(a) To paralyze sensation (general anesthetics):
Æther
Æthylis Chloridum
Chloroformum
(b) To induce sleep and rest (hypnotics or narcotics):
Alcohol
Chloralum Hydratum

Codeina
Morphina
Opium
Paraldehydum
Scopolaminæ Hydrobromidum
Sulphonethylmethanum
Sulphonmethanum
Veronal

(c) To relieve pain (analgetics or anodynes):

Acetanilidum
Acetphenetidinum
Acidum Salicylicum
Alcohol
Antipyrina
Aspirin
Chloralum Hydratum
Codeina
Methylis Salicylas
Morphina
Morphinae Sulphas
Sodii Salicylas

VII. Drugs Used to Reduce Fever Temperature

Acetanilidum
Acetphenetidinum
Acidum Salicylicum
Aconitum
Ammonii Acetatis, Liquor
Antipyrinum
Aspirin
Guaiacol
Phenol
Quinina
Sodii Salicylas

VIII. Drugs Used for Their Effects on the Liver

To Increase the Secretion of Bile, Cholagogues:

Acidum Salicylicum
Fel Bovis

IX. Drugs Used for Their Effects on the Blood

To Increase the Hemoglobin:

Arseni Trioxidum
Ferri Carbonas
Ferri Iodidum
Ferri Phosphas Solubilis
Ferri et Ammonii Citras
Sodii Arsanilas
Sodii Cacodylas

To Render the Blood Alkaline:

Potassii Acetas
Potassii Bicarbonas
Potassii Citras
Sodii Bicarbonas
Sodii Carbonas

To Increase the Coagulability (?):

Calcii Chloridum
Calcii Lactas

X. Drugs Used for Specified Diseases

In Malaria:

Arseni Trioxidum
Quinina

In Syphilis:
- Hydrargyri Chloridum Corrosivum
- Hydrargyri Chloridum Mite
- Hydrargyri Iodidum Flavum
- Hydrargyri Iodidum Rubrum
- Hydrargyri Salicylas
- Hydrargyrum
- Potassii Iodidum
- Salvarsan
- Sodii Iodidum

In Rheumatic Fever:
- Acidum Salicylicum
- Aspirin
- Methylis Salicylas
- Sodii Salicylas

In Myxedema and Some Other Thyroid Diseases:
- Glandulæ Thyroideæ Siccæ
- Potassii Iodidi
- Sodii Iodidi

In Diphtheria:
- Serum Antidiphthericum

In Tetanus:
- Serum Antitetanicum

In Cerebrospinal Meningitis:
- Serum Antimeningococcus

In Trypanosomiasis:
- Antimonii et Potassii Tartras
- Sodii Arsanilas

In Gout:
- Acidum Phenylcinchoninicum
- Colchici Semen

XI. Drugs Used for Their Effects on the Skin

See also:
- Corrosives or Caustics
- Emollients and Protectives
- Local Anodynes and Anesthetics

Irritants:
- Aconitum
- Alcohol
- Ammonia
- Camphora
- Cantharis
- Capsicum
- Iodum
- Menthol
- Sinapis
- Terebinthinæ Oleum
- Tiglii Oleum

Disinfectants or Irritants Used Chiefly in the Form of Ointments in Parasitic Skin Diseases:
- Balsamum Peruvianum
- Benzoinum
- Camphora
- Chrysarobinum
- Hydrargyrum
- Ichthyol
- Iodum
- Pix Liquida
- Resorcinum
- Sulphur
- Thymol

Arsenic, Potassium, Iodid, etc., May Be Used Internally in Skin Diseases:

Drugs Administered Internally to Increase the Secretion of Perspiration, Diaphoretic or Sudorifics:

Ætheris Nitrosi, Spiritus
Antimonii et Potassii Tartras
Camphora
Ipecacuanha
Opium
Pulvis Ipecacuanhæ et Opii
Pilocarpinæ Hydrochloridum

Drugs Administered Internally to Lessen Secretion of Perspiration:

Atropina
Atropinae Sulphas
Belladonna

XII. Drugs Used Locally for Their Effects on the Eye

See also:

Astringents
Disinfectants
Caustics
Anodynes and Anesthetics

Drugs Dilating the Pupil and Relaxing the Accommodation, Mydriatics:

Atropina
Atropinae Sulphas
Cocaina
Cocainae Hydrochloridum
Homatropinæ Hydrobromidum
Scopolaminæ Hydrobromidum

Drugs Contracting the Pupil and the Ciliary Muscle, Myotics:

Physostigminæ Salicylas
Pilocarpinæ Hydrochloras

OTHER PROPERTIES OF WELL-KNOWN DRUGS

The following classification is taken from "Introduction to Materia Medica and Pharmacology" by Oliver T. Osborne.

Drugs and Preparations Which May Cause an Eruption on, or Itching of, the Skin:

Antitoxin
Arsenic
Belladonna
Bromids
Chloral
Copaiba
Iodids
Opium
Quinin
Salicylic Acid
Synthetic Compounds
Volatile Oils, and drugs containing them.

Drugs Which May Change the Color of the Urine:

Drugs that increase its amount cause it to be lighter.
Drugs that irritate the kidneys cause it to be darker.
Methylene-blue causes it to be green, if acid.
Phenol may cause it to be brown.
Santonin causes it to be yellow, if acid; purple, if alkaline.
Senna may cause it to be red, if alkaline; yellow, if acid.
Sulphonal may cause it to be very dark.

Drugs Which Color the Feces:

Bismuth salts color them black or dark gray.
Colchicum colors them greenish.
Iron colors them black.
Mercury colors them green.
Purgatives cause them to be darker.

Drugs Which Are Excreted with the Milk:

Arsenic
Bromids
Hexamethylenamin
Iodids
Lead
Mercury
Opium
Quinin
Sulphur
Vegetable Cathartics
Volatile Oils

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